

AMERICAN GAS ASSOCIATION MONTHLY



Vol. V

No. 1

JANUARY, 1923

"The public is less concerned with the precise rate it pays than it is with having thoroughly efficient service."—

**GEO. B. CORTELYOU,
Centenary Celebration,
Franklin Institute
Philadelphia, Pa., April 19, 1912**

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APPEARING HEREIN, THE ASSOCIATION DOES NOT HOLD ITSELF RESPONSIBLE

AMERICAN GAS ASSOCIATION MONTHLY

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American Gas Association Monthly

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Happy New Year!

TO OUR members, company and individual, to the entire industry, to every one of its thousands of employees, we extend our sincere, best wishes for the coming year.

And coupled with this is the hope that we may have the opportunity of cooperating with them even more closely and actively in the ensuing twelve months than ever before, for it is only through such a cooperation that we can best serve and they can secure to the fullest the advantages resulting from a solidly united industry.

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Gas House Heating and Water Heating as a Combined Load

N. T. SELLMAN, Asst. Secretary-Manager, A. G. A.

A paper read before the Pennsylvania Gas Association's mid-year meeting, December 8, 1922. (EDITOR'S NOTE).

IN several large cities which are supplied with manufactured gas considerable progress has been made in extending the use of this gas for house heating purposes. In New York, Baltimore, St. Louis and Denver the application of both steam and hot water boilers has established the central gas-fired house heating systems as the most automatic of all heating devices. In Portland, Ore., the same may be said of hot air heating with manufactured gas as the fuel. The work of establishing gas-fired central heating systems on a secure basis in these cities has been accomplished under a big range of fuel cost. Naturally, it was a very easy matter to popularize the use of gas in such localities where gas sold for slightly under fifty cents per thousand cubic feet, while in New York City where gas was selling for a short period

at \$1.50 per thousand cubic feet, it was quite another problem. In reviewing the varied conditions under which gas has been established as an ideal house heating fuel, it shows conclusively that service and comfort count for more than an increase in operating cost. The successful installation of house heating boilers using manufactured gas was first made less than ten years ago. Today there are thousands of such boilers in use and the industry is supplied through no less than a dozen or more manufacturers with boilers designed specifically for gas.

So far I have been very specific in always referring to manufactured gas. This is due to the fact that gas fuel was used with more or less success in the natural gas fields for years before it was successfully applied to the manufactured

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gas industry. When, however, the first attempts were made to do house heating on the higher priced manufactured gas, it was not possible to install the same appliance that had been used in the natural gas fields. Neither was it possible to establish this business by inserting burners into the fire box of coal boilers, which had also been the practice in the natural gas fields. In most communities where natural gas is available the price has advanced so that it is now common practice, even in these sections, to install properly designed gas equipment.

The following facts are taken from the house heating situation as it exists in Portland, Oregon, and shows the extent to which they have developed this field.

For the twelve months ending March, 1922, 478,000,000 cu. ft. of gas were used in Portland for house heating, representing about 18 per cent of the total amount of gas used for all purposes. Eight hundred of the 6,200 heating accounts represent cases where an entire house is heated by gas. The balance are cases where gas heating is auxiliary to solid fuel—radiant fires, floor furnaces, and space heaters being used. It is estimated that the 800 houses entirely heated by gas represent 25 per cent of the total house heating consumption. Out of the 800 installations where house heating is supplied through a central heating system, all but 50 are equipped with hot air furnaces. The remaining 50 are mostly hot water with a few steam boilers. The fact that I wish to bring out in this case is that even with a large number of central house heating installations, namely 800, it is remarkable to find that these only represent 25 per cent of the total amount of gas used for heating purposes. It, therefore, brings

out the fact that many gas men are very inconsistent concerning the subject of house heating when they refuse to entertain the idea of securing central house heating whereas they are perfectly willing to sell all types and as many space heaters as possible.

The central house heating boiler produces a much better load. It is one which can be figured on more accurately in advance, as to what may be expected, and I, therefore, feel that any gas company that is willing to exploit space heaters to any extent has no excuse for not trying to secure all the central house heating that they possibly can.

As you all know there is considerable opposition on the part of many gas companies toward the subject of house heating. In some cases this may be warranted because of lack of plant capacity and the officers do not feel that the load resulting from house heating warrants adding to the plant. In order that we may decide more intelligently whether this is a fact or not, I think that an analysis of just what kind of a load house heating produces will be of value.

Let us assume a house with 500 sq. ft. of steam radiation, the approximate gas consumption of this installation for the entire heating season will be approximately 550,000 cu. ft. The load itself will be distributed approximately month by month as follows:

October	22,00	4 per cent
November	66,000	12 per cent
December	104,500	19 per cent
January	126,500	23 per cent
February	115,500	21 per cent
March	77,000	14 per cent
April	38,500	7 per cent

The day of maximum demand will naturally be when the weather approaches zero or slightly under. The gas con-

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sumption in this case should be approximately 6,000 cu. ft. for the day. This is, therefore, the peak load for this installation and the fact that interests us, therefore, is that we may use 6,000 cu. ft. of gas on an installation where the total year's sales is going to be approximately 550,000 cu. ft.

Thus we have to supply approximately one-ninetieth of the gas in one day that we are going to sell for the entire year. In order to see just what this means we can compare it with the actual load of several gas companies as they exist at present. I, therefore, obtained this same ratio from several companies in the state of Pennsylvania, and found that it was not uncommon for a gas company to have a maximum day's demand so high that 1/200th of the gas had to be supplied in one day as compared with the total year's sales. Naturally the more nearly this ratio approaches 1/365, which would mean that the daily send-out was uniform for every day, the better it would be for the company.

The one thing that we can combine with house heating to improve this ratio would be water heating for the summer months. To show what the effect of combining house heating and summer water heating would be, I will assume a case where we install a boiler of the same size as required in the original assumption for house heating, that is, we will assume a boiler of the same size as required for the house having 500 sq. ft. of radiation and that this boiler is just the correct size for a storage water heating installation. The consumption per month for this boiler will be in the proximity of 160,000 cu. ft. per month, and in most cases where boilers are installed under these conditions, they will be in full operation five months. In other words

they will be used in the months when the large coal house heating boilers are not in operation. The ratio of the maximum day's demand for the total consumption that will be secured from this installation is 1/150th, but by combining this load with the house heating load we get the very attractive ratio of 1/250th. Thus by combining house heating and summer water heating we actually secure a load which is even better than the loads as they exist for most gas companies. The water heating installation which I have assumed would be equivalent to twenty average homes, a sixty room hotel, a restaurant serving a thousand meals a day, or an office building ten stories high with a floor area of 100 x 100.

Any of these cases will yield a consumption required to offset the house heating installation of 500 sq. ft. of steam radiation. Every city has its hotels, restaurants and office buildings, where the hot water is made by the same apparatus that does the heating during the winter months, and where this equipment is then of necessity operated inefficiently under light summer loads. Auxiliary gas apparatus is the ideal equipment to take care of this summer water heating and every effort should be made to secure it. The competition with coal in this case is much more favorable than it is for house heating. The house heating installation which we assumed of namely 500 sq. ft. of steam radiation and where our approximate gas consumption for the season will be 550,000 cu. ft. competes with approximately 15 tons of coal per year. The water heater installations, however, which will yield 160,000 cu. ft. of gas per month compete with about six tons of coal per month. This is of course on the assump-

tion that the coal equipment consists of a boiler which is used in the winter time for house heating and water heating, and in the summer time for water heating only.

The characteristics of gas make it the most easily controllable of all fuels and it is therefore a mistake not to take full advantage of this fact when designing or installing gas heating equipment. Every central gas fired heating plant should be thermostatically controlled. Temperature control as used in conjunction with gas boilers means uniform comfort, minimum attention and high efficiency. It has been the writer's observation that where temperature control is used the gas consumption is so proportional to the outside temperature that it is possible to estimate the gas consumption for any given condition to a nicety. It is possible to tell a consumer in advance what his gas consumption will approximate month by month as well as for the entire heating season. When no control is used this is absolutely impossible and all the other outstanding good features of gas heating are, as well, more or less sacrificed. For private dwellings and small apartment houses one thermostat properly located has shown itself to be sufficient. The only precaution necessary in this case is that the thermostat be located on an inside wall in a space equipped with the correct amount of radiation and that the space is in all respects representative of the average conditions throughout the house. In private dwellings this has, as a rule, been found to be an inner wall in the living room. If the building houses several families or is put to a varied number of uses, single thermostatic control is not satisfactory and it is then necessary to use individual room control.

The following describes briefly what should constitute a complete gas-fired steam heating plant.

The first consideration is that the boiler should be one designed for gas, which means that the burner equipment should be capable of functioning from full load to no load under automatic control without any burner troubles. In instances where the gas pressure may vary more than 50 per cent, better operation will result with the use of a pressure regulating gas governor. In addition to all the customary steam boiler accessories, there should be a steam pressure regulating governor which automatically turns the gas on and off and thus maintains a predetermined steam pressure within a small variation. The thermostat should work either on the same valve as the automatic steam pressure regulator or else on a separate snap-acting gas valve. Recently a few manufacturers of steam boilers have added an automatic low water fuel cutoff. This operates so that the gas is automatically shut off should the water go below a safe level in the boiler and in turn re-opening the gas valve in the event that the water returns to the boiler. In the case of hot water boilers, a thermostat is placed in the hot water riser and thus automatically maintains a predetermined circulating temperature. This replaces the automatic steam pressure regulator used on steam boilers. This thermostat is used in addition to the regular room heating thermostat which is so strongly recommended for all gas-fired heating boilers. The remainder of the equipment used for hot water boilers is similar to all hot water heating equipment.

For the purposes of estimating what the gas consumption should be on any

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given installation, the following factors are valuable:

For steam installations the consumption will be approximately 1,100 cu. ft. of gas per sq. ft. of radiation for the heating season.

For hot water installations the consumption will be approximately 550 cu. ft. of gas per sq. ft. of radiation per heating season.

You will note from these figures that hot water installations are considerably more efficient than steam. This is accounted for by the fact that the working temperature of a hot water boiler is lower than that of a steam boiler and then again, the thermostat, which should always be located in the hot water riser on the hot water boiler, gives us better control in this case.

The boiler size to be selected for installation where thermostatic control is to be used should be, installed sq. ft. of radiation plus 25 per cent for quick heating. If no thermostatic control is used the boiler should be rated at twice the total sq. ft. of steam radiation installed. These two different methods of figuring have proven very satisfactory and fortunately the saving in the boiler size by using thermostatic control practically pays for the thermostat and its installation. The saving in gas consumption, which will follow from the use of a thermostat will be considerable but one which can never be estimated. In fact, the gas consumption on installations where no thermostatic control is supplied, varies entirely with the amount of attention the boiler is given and in some cases that have come to my attention, the gas consumption has been more than double that ever found on an installation of equal size equipped with control.

In order to figure the daily gas con-

sumption for any given temperatures the following factor can be used: .2 of a cu. ft. of gas per sq. ft. of radiation per degree of heating.

By degree of heating is meant the difference between the outside temperature and 65 deg. Some people may raise the question of why 65 deg. is used in this case when we actually heat the rooms to 70 deg. The reason for this is, that the temperature as reported by the weather bureau is an average for the 24 hours and the average temperature maintained inside a house for 24 hours, when we include night temperature, is nearer to 65 deg. than it is to 70 deg. To prove this, if we take the daily consumption for any installation and plot this against the outside temperature, we find that zero consumption occurs when the outside temperature is 65 deg. These figures will be found useful in checking high bill complaints and in adjusting an installation when first installed.

In order to enter the house heating and large volume water heating business on a lasting basis, it is very essential that we familiarize ourselves with every detail pertaining to the appliances that are to be used in this work. We should know the exact rating that boilers will yield on our local gas. This can only be determined by actual test or by making trial installations. In either case be sure that the rating was not determined under conditions that were more favorable than those which will usually be encountered. This warning refers mainly to gas pressure and flue connections as it is evident that we will not get the best possible output from a boiler where the gas pressure is below normal and where the flue may occasionally be subject to backdraft. It is, therefore, safest to rate all boilers at a gas pressure that is sure to be available

at all points on our distribution system and also to be sure that no flue connection is used during this rating test.

Once having determined a conservative rating, we are in a position to estimate more accurately without any fear that some unforeseen condition will cause the equipment to fall short of performing the necessary work. For the purpose of estimating there is sufficient data available for accurate computations of both house heating and water heating prospects. Reports issued by the weather bureau should be consulted in order to determine what your local maximum temperature range below room temperature may be. For this section of the

country this is usually figured at 70 deg. which means that 0 deg. F. is the lowest outside temperature at which the heating plant will be able to maintain 70 deg. inside temperature.

With the few figures and facts mentioned in this paper I hope I am presenting some new angles and leaving with you some new thoughts on these subjects which may increase your interest and make these applications appear more attractive. I would preferably leave you in a determined mood to go out and get some of this business which I assure you is waiting for you to at least some extent in every locality.



A New Book on the Gas Industry

FOR years Oscar Edward Norman, librarian and superintendent of training and education of the Peoples Gas Light and Coke Company of Chicago, has been collecting personal anecdotes, historical incidents and other data pertaining to the gas industry for the purpose of weaving it into an entertaining volume.

His task was brought to a completion recently with the publication of a 200-page book, generously illustrated, entitled "The Romance of the Gas Industry." It is the most refreshing and original bit of literature ever published on the gas industry.

To gain an idea of the ground covered by Mr. Norman it is only necessary to mention his chapter headings. These are: The Birth of Mother Earth, How the Quest for Gold Revealed the Soul of Coal, the "Wild Spirit" Rediscovered and Tamed, How a Madman Started the First Gas Company, "A Light Here Maids, Hang Out Your Light," How the Sunshine Is Released for the Use of Man, The "Gas Fairy" In the Household, Gas Service—the Growing Giant in Industries, A City Beautiful Within Twenty Years, and "Semper Fidelis."

"The Romance of the Gas Industry" deserves a careful reading from every gas man who feels proud of his affiliation with an industry now undergoing such an astounding growth. For future executives of the business, it is a volume of great instructive value. Copies sell for \$1.50 and orders should be sent direct to Mr. Norman.

The Advisory Council

AT the Fourth Annual Convention of the American Gas Association, which was held in Atlantic City, October 23-28, the following amendment to our Constitution and By-Laws was adopted:

Article V

Section 3.

There shall be an Advisory Council consisting of members of the Association who are past members of the Executive Board. The members of this Council shall serve for a period of four years from the date of expiration of their term of office as members of the Executive Board and shall meet with the Executive Board at least once each year and at such other times as the President or Executive Board may deem advisable.

Membership in this council shall not carry with it any special voting privileges.

Upon the adoption of this amendment the first Council shall be formed to consist of all who served as members of the Executive Board from the date of the Association's organization.

Pursuant to the adoption of this Amendment, the Council has been formed, as follows:

Geo. S. Barrows, Providence, R. I.
W. H. Barthold, New York, N. Y.
S. T. Bodine, Philadelphia, Pa.
Nicholas F. Brady, New York, N. Y.
A. P. Brill, Pittsburgh, Pa.
John A. Britton, San Francisco, Cal.
Howard Bruce, Baltimore, Md.
C. N. Chubb, Davenport, Iowa
Chas. M. Cohn, Baltimore, Md.
R. C. Congdon, Atlanta, Ga.
Rufus C. Dawes, Chicago, Ill.

E. S. Dickey, Baltimore, Md.
Halford Erickson, Louisville, Ky.
W. Griffin Gribbel, Philadelphia, Pa.
Ewald Haase, Milwaukee, Wis.
R. B. Harper, Chicago, Ill.
A. A. Higgins, Providence, R. I.
Samuel Insull, Chicago, Ill.
A. P. Lathrop, New York, N. Y.
Sidney Mason, Gloucester, N. J.
T. N. McCarter, Newark, N. J.
H. A. Norton, Boston, Mass.
W. H. Pettes, Newark, N. J.
A. P. Post, Philadelphia, Pa.
J. L. Richards, Boston, Mass.
M. C. Robbins, New York, N. Y.
Geo. D. Roper, Rockford, Ill.
H. D. Schall, Detroit, Mich.
Geo. Williams, New York, N. Y.
E. N. Wrightington, Boston, Mass.

Possibly nowhere could another list of names such as this be compiled—a list that would mean as much. It is a list that the entire gas industry may be proud of and certainly a list which this Association should look upon with mixed feelings of gratitude, and satisfaction.

The Association is indeed grateful to these men for it is through their services, unselfishly given without stint in the fullest degree, that its present strong position to a very great extent is due. Called upon to guide its policies through the first years and those succeeding, they did not shirk their task nor hesitate to give in the fullest of their time and ability.

The Association looks upon this list with satisfaction because, by placing their names on the Advisory Council, it can, in a small measure, express its great indebtedness.

The Association is more than thankful that while so honoring these men, it can still receive the benefit of their wise councils and advice as in the past.

An opportunity of this character that allows both a small expression of appre-

ciation to these men whose work has contributed so much to the success of the Association, and also perpetuates their services to the Association is indeed something to be thankful about.



What the Investment Bankers Association of America Has to Say About the Utilities

Extracted from the Annual Report of the Committee on Public Service Securities of the Investment Bankers Association of America. (EDITOR'S NOTE).

IT would be strange indeed if the public utility industry, unlike all other forms of business enterprise, should have emerged from the upheavals of the great war with no changes in the conditions of its existence, no new problems to confront it. Like others it was obliged to meet higher operating costs and heavier taxes with reduced income. The large increase in the number of private automobiles in operation and jitney and auto-bus competition have made inroads into the patronage which the electric roads would otherwise have enjoyed and the construction of parallel hard surfaced roads will probably further, and sometimes wastefully, multiply transportation facilities and divide the available business. New capital, or capital to meet maturing bond issues, has been and is still unduly costly to all public utility companies, because their securities must compete in the money markets with an enormous volume of tax-free municipal bonds. It has been authoritatively stated that more than one billion dollars of such tax-exempt securities were issued in 1921.

On the other hand, these adverse and discouraging conditions seem likely to be overcome by favorable and encouraging ones. Costs have declined considerably and gradually improving general business conditions are bringing some increases in earnings. The practical experiences and lessons of the war and its aftermath seem to have done much to clear the atmosphere and bring about a more widespread popular understanding of the value and necessity of the services supplied by the public utility companies, the advantages of private ownership and operation under sane public regulation, and the economic and financial conditions under which efficient and satisfactory service, keeping pace with public demand, alone is possible. The present practice of many utility managements of frankly discussing the problems of the industry with its patrons is stimulating public confidence and good will. There is a growing recognition of the real mutuality of interest between the companies and their patrons. To paraphrase a recent statement of the president of one of our most successful railroad companies:

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(1) The customer's attitude toward a public utility can now be guided and made informed and friendly.

(2) Satisfied customers now can be used to build up good will.

(3) Pleased customers will voluntarily help a utility to get a new business.

This better mutual understanding already has enabled the managements to eliminate much useless expense and many artificial obstructions to efficient operation, and has removed much of the uninformed popular objection to adequate rates. It certainly will bring many other practical and profitable advantages including improved credit. Investment bankers will naturally give great weight to such favorable conditions in considering public utility financing.

As has been stated in previous reports, this committee has faith in the fundamental soundness of the public utility business, including gas and transportation as well as power and light. There is an insistent and, we believe, permanent demand for the services it renders. We expect that public utility credit will be soon established upon a basis of greater permanency and stability than ever before. As in other industries, there will be exceptional situations and discrimination and sound judgment will be required. But the solution of the impending financial problems of the public utility companies will, in our opinion, afford investment bankers opportunities for both constructive public service and profit, and will demand the assumption of duties and responsibilities from which they should not shrink.

Supplemental Report

On account of certain recent developments, it seems desirable to your committee that the Investment Bankers As-

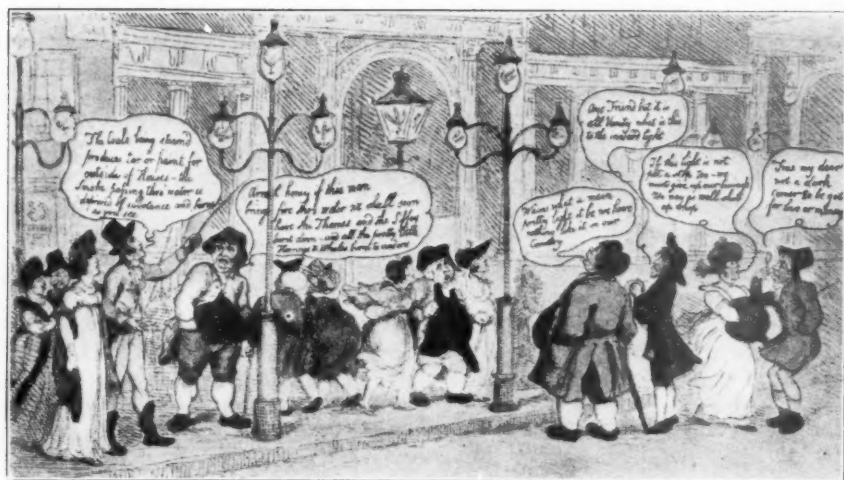
sociation of America make clear its position in regard to a certain feature of the regulation of public utilities.

The history of the development of the public utility business has proved conclusively that, in the interest of the public served, it is essential to avoid duplication of plant investment, and such duplication can best be avoided by the establishment of a monopoly controlled by sane state regulation. Such regulation as developed at present by most state public service commissions, not only restricts the issuance of securities, but also limits the earnings of the corporation. It, therefore, becomes obvious that if the corporation is prevented in times of peace from accumulating a cash reserve from which wasteful competitive battles may be financed, it must be protected from the raiding of uncontrolled competitors. The power to restrict, vested in the hands of state authorities, therefore, imposes upon such authorities the necessity and obligation to protect the corporation, and it is obvious that this restriction and protection is essentially desirable to the public interest, as the removal of the burden of unnecessary investment or the maintenance of an unnecessary cash reserve avoids the necessity of ultimately increased rates. It is also true that protection must not be carried to a point where the protected public utility becomes indifferent to the character of the service. It must be kept efficient through the fear of competition in the event of failure to maintain efficient service. It has been demonstrated, therefore, that the best method of protecting the company from harmful and wasteful competition and at the same time to assure proper efficiency is through the authorization of a state regulatory body to determine when and under what con-

ditions utility service shall be extended into every given territory and to issue or decline to issue a "Certificate of Public Necessity or Convenience" which is pre-requisite to the construction of such extensions.

In view of the large amounts of new capital required for additions and extensions of facilities to provide for normal growth and the increased demands of

various communities for new utility service, this committee feels that any efforts which might result in reverting to discarded theories of competition in the public utility business would be destructive to the confidence that has been built up among investors in public utilities securities and could not be other than harmful and expensive to both investors and the public served.



An Illustration in O. E. Norman's New Book, "The Romance of the Gas Industry."
See Review on page 8.

Reading from left to right, the conversations described are as follows: "The coals being steamed produce tar or paint for outside of houses—the smoke passing through water is deprived of substance and burns as you see." "Arrah, honey, if this man bring fire through water we shall soon have the Thames and the — burnt down—and all the pretty little herrings and whales burnt to cinders." "Waums, what a main pretty light it be—we have nothing like it in our country." "Aye, Friend, but it is all Vanity. What is this to the inward light?" "If this light is not put a stop to we must give up our business. We may as well shut up shop." "True, my dear. Not a dark corner to be got for love or money."

GENERAL

CHAIRMEN OF GENERAL COMMITTEES ORGANIZED TO DATE

Accident Prevention—F. W. FISHER, Rochester, N. Y.
Amendments to Constitution—WM. J. CLARK, Mt. Vernon, N. Y.

American Engineering Standards Committee, Representative on—A. H. HALL, New York, N. Y.—
(Alternate Representative) W. J. SERRILL, Philadelphia, Pa.

Award of Beal Medal—R. B. BROWN, Milwaukee, Wis.

Chamber of Commerce—D. D. BARNUM, Boston, Mass.

Cooperation with Educational Institutions—C. N. CHUBB, Davenport, Ia.

Finance—JAMES LAWRENCE, New York, N. Y.

Gas Safety Code—W. R. ADDICKS, New York, N. Y.

Gas Standards—J. B. KLUMPP, Philadelphia, Pa.

Geographic Sections—L. R. DUTTON, Jenkintown, Pa.

National Fire Protection Association—R. S. DOULL, New York, N. Y.

Nominating—C. M. COHN, Baltimore, Md.

Rate Fundamentals—R. A. CARTER, New York, N. Y.

Standard Gas Appliance Specifications—W. T. RASCH, New York, N. Y.

United States National Committee of International Commission on Illumination, Representative on—HOWARD LYON, Gloucester, N. J.

The Spirit of Organized Business

JULIUS H. BARNES, President of the Chamber of Commerce of the United States.

LOYALTY to family and friends, to city and to state, is a universal human virtue. Loyalty to voluntary business associations, however, to be enduring, must find a stronger motive than that of selfish personal interest. To be a live community force, it must rest upon the strength of an appeal to standards and ethics that touch something that lies deep in every man. In organized business, the motive which has multiplied trade and community business organizations, and has quickened their influence in trade circles and community life, has been a clearer understanding of the part they play in the maintenance of fair play. There has been, to be sure, a recognition of the effectiveness of team-play through organization, but through it all the inspiration has been, after all, that in the democracy of organization, as in the democracy of the commonwealth, man-to-man association with equal rights and

equal opportunities, satisfies the universal aspiration for conditions of absolute equality, the equal chance of fair play.

The foundations of this republic were laid by men of courage and ambition, rebelling under a social and political autocracy which suppressed the freedom of opportunity known as fair play.

It was not fair play when only those men fortunate in birth or in fortune possessed a voice in the selection of the administrative officers and the enactment of laws under which all must live. In America there was established universal suffrage, one vote for each man, a response in that day to the aspirations of fair play.

It then developed that it was not fair play that the women of a community had no voice in the laws that governed them, and the public conscience only recently eliminated this violation of fair play.

It is not fair play, today, that organizations of men, associated for lawful activities and rightful ends, shall stand unequal before the law, with exemptions for organizations of labor or organizations of growers. The time will come, and soon, when these inequalities will be removed, because they violate the fundamental human sense of fair play.

It is not fair play that organizations of men shall deny the right to work to men of other views. It is increasingly clear that public opinion condemns organizations, that, by force and violence, offend the public sense of fair play.

It is not fair play when organizations, with whatever claim of proper purpose, avoid their own responsibility, by shrouding their identity behind the mask and hood. Organizations of that character can maintain their existence only if the community depart entirely from the ideals which preserve fair play.

It is not fair play if there be evolved, either from human laws or from social custom, a system which would encase a man in the social strata in which he is placed by accident of birth. In the Old World this rigid caste system freezes into social strata, and stifles individual talent and ambition. It is, indeed, the cause of and the excuse for the injection into government of organizations frankly devoted to the interest of a single section of their people. But where no doors are closed by accident of birth or station against those possessed of superior ability or devoted to superior effort, there is no excuse for the formation of political influence on the basis of trade or social position. Labor parties or farm blocs have no lasting place under the American conditions of national fair play.

It is not fair play for a government, exercising exclusive authority, to issue cur-

rency denominations, in which is recorded the savings of thrift and self-denial, the provision of life insurance protection for survivors, and on the stability of which depends the healthy functioning of trade and commerce, on which rest employment and opportunity, and therefore the happiness and content of its peoples, to deliberately inflate or deflate the value of that traditional measure of value, with its resultant distress and disaster. It should be America's chiefest pride that in these recent years of reckless currency inflation in other lands, recording the betrayal of a sacred public trust and the destruction of the economic life and happiness of whole peoples, that our record is one of intelligent effort in the stability of currency, and the profoundest response thus, on the part of government, to the preservation of fair play.

It is not fair play that the necessary power of regulation of those public services which necessarily possess the character of monopoly, such as railroads, traction services, or public utilities, shall be administered in such a narrow view of selfish interest and such total disregard of solemn responsibility that the investments that created these public services shall be undermined or destroyed. There is every evidence that we have passed the era of unfair and short-sighted over-rigid regulation, and are administering the public responsibilities toward those necessarily publicity-regulated public services with a more enlightened vision of fair play.

It is not fair play that the public services should be operated by the state, overmanned often for political support, the services provided below the actual cost of operation, and the resultant deficit made up from public monies assessed

through the power of taxation levied on all its citizens.

It is not fair play that, through unequal and unwise taxation, special sections of our people, numerically strong, shall levy an unfair burden, in a spirit of envy and resentment, against those other groups more fortunate than themselves. The range of employment opportunity is constantly widened with the establishment of new enterprises, and taxation which destroys the human incentive of prospective earnings against the unusual hazards of new ventures, and which stifles the willingness to take the risks of new trade and business ventures, is unwise as well as a violation of fundamental fair play.

It is not fair for a group of men temporarily in position of authority in national legislation to vote, for any purpose, gigantic appropriations from the national treasury, and seek to avoid the responsibility of providing the revenues from which these appropriations can be paid. To leave to their successors the perplexing problem of providing the means of payment, while they, themselves, short-sightedly seek the present approval of those who benefit by their reckless drafts upon the public funds, is a distressing violation of the principles of fair play.

Organized business does not arrogate to itself a superiority of understanding of the ethics of fair play, nor does it plume itself as expressly the champion of that cause which carries a deep appeal to men of every station. Organized business, however, responsible not only for its own well-being, but because of its position as largely the directors of industry, and therefore responsible for the opportunity and employment of many times its numbers, has an especially keen

appreciation of the atmosphere in which human activities may prosper. Organized business has a keen appreciation that the incentive to all effort rests on the confidence that superior service in any form will be rewarded, and those rewards secured and protected.

Under conditions of absolute fair play between individuals, society apportions through the processes of trade a sure and fair reward to those individuals who serve it best, by new inventions or superior ability in production or superior methods of distribution. In our short national history, under the stimulus of this individualistic fair play, we have led the world in applying science and invention through the service of industry in the enlargement of human comfort and content. The spectacular individual fortunes bestowed in appreciation by the methods of free and competitive trade, so far from being a social injury, are the shining goals that inspire the efforts of countless numbers of our young people. The aggregate thus of ambitious effort creates new fields of opportunities and widens old fields, with an immense quickening of human content and happiness.

In Europe, recently, we have seen social theories, preached for generations in academic discussion, put into actual operation. We have seen the communism of Russia utterly destroy the economic life of a great people and bring its famished millions to the very gateway of death, stayed only by the generous hand of individualistic America. We have seen the socialist governments of Austria and Germany violate the ethics of sound commercial practice, and financial honesty, and we see their people sinking into hopeless despair, their voices raised in appeal to be saved against themselves,

by individualistic America. The contrast between America, possessed of a substantial prosperity, and those sections of Europe where existence has become scarcely more than a struggle for daily bread and shelter, rests on something larger than the possession of natural resources or fortunate geographical location. It rests on a social and political philosophy which encourages the best effort of every individual of its hundred million people, because, assured of the freedom of opportunity and security in the enjoyment of the rewards which follow superior service. That freedom of opportunity, and its stimulant to productive effort, is secured by a theory of the relation of government to industry, for the sole and primary purpose of preserving the conditions of absolute equality and fair play. Men of narrow experience and immature processes of thought constantly attempt to use the authority of representative government for ill-considered social remedies, undermining and discouraging the multiplied individual effort which has built our splendid progress and prosperity.

In an unwise relation of government

to commerce and industry rest the seeds of potential national deterioration and decay. Organized business must be prepared to state its case with clear and convincing logic, with fairness and moderation, and with complete sincerity. In deciding what causes to support and what measures to oppose, business organizations can apply one relatively simple test to every legislative enactment and administrative act, namely: Is it a necessary step in the government's clear-cut function of the preservation of fair play and equal opportunity for every individual?

Conceptions will alter, with actual experience, to be sure, as to what activity of government may be necessary in the preservation of fair play, but if this test is applied in all sincerity, without a color of selfish interest, having in mind the preservation of the broad field of opportunity for all our coming generations of young people, the shifting frontier between government and industry will, after all, be defined with reasonable exactness. This is the truest liberalism, because it demands fair and equal opportunity for every man.



By Gum!

The manager of a Tennessee electric railway claims to have received the following letter:

If the simpering snub-nosed, tight-skirted, face-bedaubed, tittering little ninny, who stuck gum on the street car seat on the Broadway line last Thursday evening, and permitted me to sit down on it, will call at my office in the Building, she can have the gum back. It is on the southern front of my spare trousers. If she can't get the gum off she can have the pants too.

American Gas Industry Organization Compared with British Methods

Alderman FRED J. WEST, C. B. E., M. I. Mech. E.

The following appeared in the Bulletin of the Society of British Gas Industries and is reprinted as of general interest to our members. (EDITOR'S NOTE).

AT a recent meeting of the Council of the Society of British Gas Industries, I related briefly the impressions gained when attending the American Gas Convention at Chicago in November last. My remarks were chiefly directed to a comparison of American methods with British. In the result, I was asked to write a short article on the subject for the "Bulletin"; and this I have pleasure in doing.

Comparisons are sometimes said to be "odious," but I submit that it is highly instructive to contrast the present practice in Great Britain, in connection with the organizations of the gas industry, with that followed in the United States. And let it be said at once that the main purpose of this article is to emphasize the weak points of our present practice, the need for co-ordination of interests, and the advantages to be obtained by an amalgamation or linking-up of the present separately operated units into one capital organization.

The Welding of Interests in America

The formation of the present representative American Gas Association has been a gradual process. The American Gas Institute was formed in 1906 by the amalgamation of the American Gas

Light Association (originally organized in 1873), the Western Gas Association (organized in 1877), and the Ohio Gas Light Association (organized in 1901). The National Commercial Gas Association, which was formed in 1905, was the first departure in the way of an organization of the purely commercial side of the gas business in the United States. It rapidly grew in membership, and became an active and powerful organization, and did much to advance the commercial development of the gas business during the thirteen years of its life. Throughout this period the American Gas Institute held undisputed sway as the national organization representing the engineering and technical side of the business. About 1911 or 1912, however, there began to be talk in favour of the amalgamation of the two Associations, so as to have but one national organization in the country. Such a plan had many advantages, but there was also considerable opposition from both the technical and commercial sides. As time passed, however, the objections became less pronounced, and with the impetus given by war conditions, the added need for economy, etc., the long discussed amalgamation became a reality in June, 1918.

Thus it was that in the year named the present American Gas Association came into being, and successfully welded

together the several then existing organizations in the United States. It is generally agreed that the gas industry there is now provided with a well-organized and powerful central operative body, which can also act in a representative capacity as occasion demands.

The Association is sub-divided into several sections as follows:

- Accounting Section
- Advertising and Publicity Section
- Commercial Section
- Technical Section
- Manufacturers' Section

The work of the Association as a whole, and its general and sectional activities, are in the closest co-ordination. Each section is in touch with the work the others are doing; duplication of effort is being avoided; and non-essential work is being eliminated to the greatest possible degree. In short, the executive board and management of the American Gas Association are endeavouring to conduct its affairs with the same degree of efficiency and thoroughness that would govern the administration of any progressive, successful business enterprise.

Higher Efficiency by Co-operation and Co-ordination

It would savour of lack of appreciation to belittle in any way the extremely useful work performed in the past by the existing organizations in the British gas industry. It can be said without fear of contradiction that they have all more than justified their existence, and have advanced to a state of high efficiency in our various and complicated interests. But there is now over-lapping; there are too many divisions into watertight compartments; there is conservatism and suspicion; and the time of prin-

cipals is too much occupied in attending meetings.

A Valuable Lesson

Not the least of the outstanding and valuable lessons from the Great War is that of the advantages to be obtained from the concentration of effort, the grouping of interests, and the co-ordination of aim and object. The war found the gas industry inadequately represented on matters of national importance, and new organizations sprang into existence, which, under able leadership, accomplished great things. But the time has surely and opportunely arrived when the need for reorganization of our many interests has very definitely asserted itself. It is not a time to suggest that any one of the existing organizations is unimportant, and can be dispensed with. I deliberately assert, however, that it is a time when all should be bonded into one central and head organization, in which the various interests of our great industry would be re-organized and catered for.

Position of Contractors and Manufacturers

Thus far I have refrained from commenting on the invidious and isolated position occupied by contractors and manufacturers under the present state of affairs. Much has been written, and could be written, upon this deficiency, which is detrimental to the best interests of the industry; and it is a subject upon which the writer and others feel keenly and sorely. No useful purpose, however, would be accomplished by the opening of old sores, supplemented by recriminations on the mistakes of the past; nor is it the intention in a last

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subtle paragraph to introduce this vexed question as the main point for solution. But let it be said—and I say it with a full consciousness of its truth—that our important side of the industry is willing and anxious to devote its best talents,

brains and influence to a problem which is capable of successful solution in a manner and on a basis which must undoubtedly lead to greater efficiency and the establishment of the industry on a broader and sounder basis.



WOULD LIKE TO KILL HIM



Courtesy of the State Gazette, Trenton, N. J.

Have These Escaped Your Attention?

All good merchants believe that if the article is good enough to sell it is good enough to advertise.

That is our position and Association Service is the article.

Therefore, in case those services listed below may have been overlooked, we again bring them to your attention.

They are ready for you. Can you make use of them?

Good Will Literature

Our latest booklet is "Hints for the Housewife." Some of the chapters in its sixteen pages are: Clean Appliances, Correct Gas Flame, Gas-Saving Utensils, Cooking Economies, Cooking Suggestions, Oven Temperature, Hints on Gas Lighting, Cheap Tubing, etc. The booklet is full of practical, money-saving information for the uses of gas. Price: \$20.00 per thousand copies, including cost of imprinting company name and address on cover. Special price of \$17.50 per thousand copies is allowed on orders of 10,000 or more.

Other booklets available: "Truths about the Meter," an eight-page, popular, treatise on the accuracy of the meter with complete instructions regarding meter reading, etc. Same price as above. "The Men Who Make Friends," a sixteen-page pamphlet for the employee. Available in small quantities free of charge.

Miscellaneous

"Gas Chemists Handbook," 1922 Revised Edition, \$6.00 a copy; "Ideas for Window Displays of Gas Merchandise," \$2.00 a copy; "The Public Utilities," a 96-page booklet containing a wealth of informative matter in the public utility industry, sample copies free; "Salient Features of Electric Cooking, Electric Hot Water Heating, and Electric House Heating," by S. S. Wyer, sample copies free; "Heating Water by Gas," a 25-page illustrated pamphlet giving proper methods of installing all types of gas-fired water heating equipment, the estimation of requirements, selection of proper equipment, etc., sample copies free; "Gas in the Industries," a pamphlet containing 18 photographs and accompanying text matter describing some important industrial uses for gas, sample copies free; "The Hygienic Value of Gas Lighting," a 20-page pamphlet by R. F. Pierce, sample copies free.

Illustrated Lecture

Our lecture on the gas industry is accompanied by 72 lantern slides showing gas at work in the home and in a score of industries. It is a popular presentation of the story of gas designed for use before customers, employees and public meetings. The lecture is in manuscript form and may be used with or without the slides. There is no charge for this service.

The New Film

"Around the Clock with Gas" is a 1,000-foot film taking about 15 minutes to project. It is a high-class, educational film depicting the gas industry and the part it plays in the domestic and industrial life of the nation. It can be included in the regular program of any motion picture house and can also be shown to clubs, schools, social and civic organizations, employees' meetings, etc. Prints of the film are loaned to companies upon request, the only cost being the payment of parcel post shipping charges. Prints may also be purchased outright at \$75.00 each, complete with reel, container and shipping case.

Advertising Copy Service

A monthly service of 13 illustrated advertisements complete with matrices for newspaper reproduction. Service includes five good-will ads. each month and eight appliance selling ads. covering every major commercial activity of a gas company. Cost of service is \$5.00 a month or \$60.00 a year, payable quarterly in advance. More than 200 company member subscribers are now using this service with good results.

A pamphlet containing 12 A. G. A. good-will ads. and proofs containing 48 Chat ads. will be sent free upon request.

ACCOUNTING SECTION

J. W. HEINS, Chairman

H. W. HARTMAN, Secretary

W. A. SAUER, Vice-Chairman

MANAGING COMMITTEE—1923

At Large

BRINE, F. A., Atlanta, Ga.
 CARSELL, W. H., Baltimore, Md.
 DAVIDSON, H. C., New York, N. Y.
 DOERING, W. A., Boston, Mass.
 FENNIMAN, J. R., New York, N. Y.
 HALL, I. F., Boston, Mass.
 HOFFMAN, F. C., St. Paul, Minn.
 JEFFREY, Jos., Scranton, Pa.
 LAWALL, H. J., Philadelphia, Pa.
 LAWRENCE, JAMES, New York, N. Y.
 LYNCH, B. W., Chicago, Ill.
 MEYERS, W. J., New York, N. Y.
 MURFIT, W. G., Newton, Pa.
 PATTERSON, F. H., Rochester, N. Y.
 POTTER, O. F., Newark, N. J.
 RASTENBURG, F. G., Indianapolis, Ind.
 REESE, J. G., Baltimore, Md.
 SCHMIDT, JR., WM., Baltimore, Md.
 SCOTT, J. M., Wilmington, Del.
 SHORT, A. F., Providence, R. I.
 TOSSELL, A. L., Chicago, Ill.
 WINTERS, A. C., Chicago, Ill.

Representing Affiliated Societies

ARMSTRONG, J. J., Toronto, Can. (Canadian)
 CLINTON, DeWITT, Worcester, Mass. (N. E. Gas Eng.)
 DEAL, E. C., Springfield, Mo. (Missouri)
 GOODNOW, A. C., Jacksonville, Fla. (Southern)
 HAASE, EWALD, Milwaukee, Wis. (Wisconsin)
 HODGES, E. W., San Francisco, Cal. (Pacific Coast)
 JAMES, F. M., Aurora, Ill. (Illinois)
 KURTZ, ADAM, Detroit, Mich. (Michigan)
 McCABE, J. B., Dallas, Texas (South Central)
 PETTER, W. H., Newark, N. J. (New Jersey)
 PHILLIPS, R. E., Lincoln, Neb. (Iowa)
 PORTER, EDWARD, Philadelphia, Pa. (Pennsylvania)
 SCORELL, E. C., Rochester, N. Y. (Empire State G. & E.)
 SHEARON, B. P., Hammond, Ind. (Indiana)
 WILBUR, A. A., Brockton, Mass. (Gas Sales of N. E.)

CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Budget—F. H. PATTERSON, Rochester, N. Y.
Customers Accounting—W. A. DOERING, Boston, Mass.
Fixed Capital Records—H. J. LAWALL, Philadelphia, Pa.
Insurance—J. G. REESE, Baltimore, Md.
Nominating—EWALD HAASE, Milwaukee, Wis.

Relations with Customers—A. L. TOSSELL, Chicago, Ill.
State Representatives and Contributions to Monthly—JAMES LAWRENCE, New York, N. Y.
Uniform Classification of Accounts—W. J. MEYERS, New York, N. Y.

Amendments to Uniform Classification of Accounts

AT the annual convention of the National Association of Railway and Utilities Commissioners which was held in Detroit, November 14-17, our Association was represented by a committee headed by President R. B. Brown.

Extracts from the address of Hon. Carl D. Jackson, Chairman of the Wisconsin Commission and President of the National Association of Railway and Utilities Commissioners, appeared in the December issue of the A. G. A. Monthly. Copies of the speech in full may be secured from Association headquarters.

Several amendments to the Uniform Classification of Accounts were recommended by the Accounting Committee, were received, ordered printed and distributed to all the Commissions throughout the country with the recommendation that they be adopted. A revised edition of the Classification, including these amendments, will be issued in printed form at an early date. The member companies will receive a copy of this revised edition as soon as it is available and additional copies will also be available to member companies at a nominal cost.

Accountants Organize for 1923

AT the meeting of the managing committee held at headquarters, November 24, the essential activities for 1923 were discussed and the following committees appointed to carry out the year's program:

Relations with Customers,

A. L. Tossell, Chairman

Scope of Committee

To make a survey of the general practice and policies of gas companies in contacts which their employees have with their customers,

(a) In the office through personal calls of customers to make applications for gas, incidental passing on credit, taking deposits, receiving complaints of high bills both in the office and on customer's premises, setting of test register, bills for estimated consumption due to cease-to-record meters, poor service, etc.

(b) In the handling of all of the above work at the office over the telephone.

(c) In the handling of all of the above work at the office through correspondence.

(d) Routines for expediting work on such orders between office and shops and consumer's premises.

(e) In the work on customer's premises, setting meters, handling service complaints, making collections, etc.

The above work not only to take into consideration the actual routines, rules and policies of the companies, but specifically any effort to develop efficiency and a proper mental attitude throughout.

(a) Schools or classes to instruct clerical employees in the technical phases of the work they are handling.

(b) Classes to improve handling of correspondence.

(c) Group effort to instil employees—both office and outside workers—with the company's policy with regard to courtesy and method of approach when dealing personally with customers.

(d) Company's policy and success in selecting and developing employees from the standpoint of desirable standards as to personnel best suited for contact with the public.

It is also proposed to give particular attention to the general credit and collection policy of companies not only from the standpoint of best results in collections, but primarily from the standpoint of a broad consideration of the effect of such policies and their execution by employees on the customers' attitude toward the company.

It is planned to devote an entire session at the next convention to discussion of this committee's report.

Budget, F. H. Patterson, Chairman

Scope of Work

To suggest methods for the preparation and administration of a budget system for the use of gas companies which will serve as a forecast of the company's activities and act as a control over expenditures.

Customers Accounting,

W. A. Doering, Chairman

Scope of Work

Taking last year's work as a basis to attempt to present to the industry defin-

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ite recommendations as to possible economies by,

(a) Taking typical companies in various parts of the country and reducing their results to a comparable cost basis. All costs to be considered confidential and published under a key. The committee's report to contain an analysis of these figures and a discussion of any special conditions affecting them.

(b) To keep in touch with the development of the so-called Baltimore System of Bookkeeping without Books through its adoption by other companies, notably the Public Service Company of Northern Illinois, etc. As this system includes the most progressive innovations designed for economies, its successful use by other companies will be one means of keeping such economies before the industry.

(c) To go further into the subject of merchandise accounting.

For the purpose of carrying on these three activities it is further proposed to appoint the following sub-committees:

Sub-committee on Costs, W. G. Murfit, Chairman.

Sub-committee on System of Bookkeeping without Books, W. H. Cassell, Chairman.

Sub-committee on Merchandise Accounting, J. R. Fenniman, Chairman.

Uniform Classification of Accounts,

W. J. Meyers, Chairman

Scope of Work

To continue its function of keeping in touch with the further adoption of the uniform classification. It is felt that the time is opportune, however, to increase the activity of this committee in encouraging the local adoption of the classification

and for this purpose a number of members have been added to the committee. It is further proposed to have the committee get in touch with the secretaries of all affiliated societies to induce the local association to at least consider the advisability of initiating a movement for adoption and further to have the state society appoint one of their members as a corresponding member of the A. G. A. committee with whom all matters in that state regarding the classification can be taken up. In states where local associations are not in existence, the state representative of the accounting section will be utilized as the corresponding member.

Insurance,

J. G. Reese, Chairman

Scope of Work

(a) To keep in touch with the further adoption of the new rating schedule, advise member companies as to means of applying schedule so as to obtain maximum reduction in rates, and to keep a record of actual reductions obtained through re-rating, also to attempt to secure further reduction in the base rate for fire insurance by showing that there is still a large discrepancy between premiums paid and losses claimed by the industry.

(b) To continue the fire prevention work initiated last year by improving housekeeping conditions, preparation of self-inspection blanks, etc.

(c) To enlarge scope of the committee to cover the entire field of insurance, including liability insurance (particularly workmen's compensation) and the standardization of insurance forms and clauses contained in gas company policies.

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Fixed Capital Records,

H. J. LaWall, Chairman

Scope of Work

To give further consideration to specific recommendations for a uniform and flexible practice for gas companies in this form of record. The chairman advised he had appointed engineers as well as accountants on the committee so as to get the engineers' viewpoint on the work.

State Representatives,

James Lawrence, Chairman

Scope of Work

To continue its important and dual function of,

(a) Acting as a medium for the exchange of information on accounting and commercial office subjects.

(b) Securing of accounting contributions to the A. G. A. Monthly.



Exhibit of the Consolidated Gas Co. of New York at the recent Hotel Men's Exposition.

The Uniform Classification of Accounts in Relation to State Commission Requirements

GEORGE C. MATHEWS, Statistician, Railroad Commission of Wisconsin.

IF I were to attempt a critical analysis of the new classification and an exposition of its more important features, I feel sure that you would find but little of interest in what I might have to say, as your own study of the classification would give you more information than could be included within the limits of this paper. Consequently, I concluded that specific praise or condemnation of that system would serve no useful purpose, except as I might relate criticism to the work of the State Commission.

Some review of conditions which led to the formulation of the new classification may be in order. Regulation of public utilities, which in its present form, is a development of the past fifteen years, required certain administrative agencies which most of the states have attempted to provide in the form of commissions. In order that these bodies might function, legislatures generally gave them broad powers of supervision and inquiry, among which was the power to establish uniform classification of accounts. Most of the public utility laws provide for the establishment of uniform classifications. The idea of uniform accounting was a popular one and the embodiment of the requirement in regulatory statutes was considered an important part of the program of regulation.

Despite the fact that regulation of utilities is now a matter of several years' standing in most states, it is probably a fair statement to say that state requirements regarding accounting have hardly

passed the tentative or experimental stage. A number of causes have been responsible for this condition. Naturally it has taken years for state commissions to so thoroughly familiarize themselves with the requisites of gas corporation accounting that they might be in a position to establish proper accounting standards, and it was not until commissions had generally come to appreciate the importance and difficulty of carrying out the legislative requirement for uniform accounting, that they took effective steps to cooperate in establishing an adequate system. In 1919 the National Association of Railway and Utilities Commissioners instructed its committee on statistics and accounts to prepare classifications of accounts for several classes of public utilities, it being evidently the purpose of the Association to prepare the way for uniform accounting throughout the country.

The accomplishment of such a purpose requires time, of course, but since 1919 the committee has submitted classifications for gas and electrical corporations which the National Association has recommended to its members for adoption and which have been adopted in several states.

That this has been made possible has been due very largely to the constructive help obtained from the accounting committees of the National Electric Light Association and the American Gas Association and by the willingness of those committees to cooperate, without undue

insistence on the personal views of their members, in developing the new classifications. I think it will not be construed as a claim for undeserved credit for our committee if I say that we, in turn, tried to bear in mind that our purpose was to secure a sound, workable classification to serve the purposes of the industries and the state commissions and not to stand too strongly upon positions marked out by personal preference. Approaching the question in this spirit, your committee and ours soon found that most of their differences were not fundamental, that the principles for which they stood were harmonious if not identical and that a willingness to discuss differences with the firm purpose of reconciling them, made agreement on a classification relatively an easy matter.

Two general principles seem to me to have been kept in view throughout our discussions. First, that it should not be the purpose of state regulatory bodies to impose upon the industry accounting requirements not reasonably necessary to proper administration of the state laws and, second, that gas corporations should not urge any treatment of accounts which would place any real difficulty in the way of the state regulating bodies.

The attitude which our committee tried to maintain was, as stated in our report to the National Association of Railway and Utilities Commissioners, "... that regulating bodies are not intended to interfere in accounting matters further than is necessary to carry out the purposes for which they were established," and that "generally the classification which is best adapted to the needs of the industry will be the one which will furnish commissions with the most reliable information."

The classification of accounts which

was prepared for the Commissioners' Association has been adopted in a number of states, as has also the corresponding classification for electrical corporations.

It would be highly desirable if classifications for other public utilities such as electric railways and heating and water utilities could also be brought into line with those for gas and electrical corporations. To secure the necessary modification of the electric railway classification, however, it would be necessary that the interstate commerce commission adopt the new classification since many of the electric railways are required to report to that commission and keep their accounts as required by it. Until steps can be taken to bring the accounting for other classes of utilities into harmony with the accounting for gas and electric corporations, there will be some difficulties arising where corporations operate several utilities. The state commissions, however, have considered it important to make a start in the direction of uniformity by working out new classifications for the gas and electrical corporations and I think the general attitude of the industry favors this procedure. We are now met with the necessity of making some changes in the classification for electrical corporations so that as far as possible there may be agreement in principle with that of the Federal Power Commission. Probably it will be desirable to modify the classification for gas corporations so that its present correspondence in form and arrangement with the classification for electrical corporations may be maintained.

The changes which the accounting committee of the National Association of Railway and Utilities Commissioners

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will be prepared to recommend for the sake of securing the greatest possible degree of uniformity with the Federal Power Commission classification were outlined rather fully at a conference in Washington a few weeks ago. This conference was attended by representatives of the National Electric Light Association, of the National Association, of Railway and Utilities Commissioners, and by the accountants of the Federal Power Commission. Because of their bearing upon the accounting of gas corporations it may be well to mention briefly the more important modifications which are in prospect. Many of the changes are matters of arrangement and form only, not affecting the fundamentals of the accounting system. There are also a number of respects in which the power commission considers that it is bound either by the specific language of the law or by the peculiar administrative requirements imposed upon it which make it important for that commission to have somewhat different procedure from that which is acceptable to the state commissions and I believe to the utility associations. In many respects, also, the power commission's accountants have agreed to modifications of their tentative system to make it conform to the state classification.

The classifications of accounts prepared for the National Association of Railway and Utilities Commissioners were not intended to be binding to such an extent as to prevent the expansion and subdivision of the system to meet different requirements. It was the hope of those who prepared the classifications that they would be sufficiently elastic to meet almost any set of needs, but at the Washington conference objection was made to the electric classification on the

ground that it did not provide with sufficient completeness for the functional grouping of fixed capital and of operating expenses. While we believe that the latitude permitted by the language of our classification would have enabled any company to obtain a functional set-up as complete as its operating conditions permit, we signified to the power commission that for the sake of uniformity we would accept and recommend subdivisions of certain accounts more definitely planned for the purpose of securing functional accounting. The criticism of the classification for electrical corporations related particularly to the importance of a functional grouping of land and structures and of keeping transmission and distribution property separate wherever possible. Some criticism has been made of the classification of accounts for gas corporations in that it does not provide by specific direction for separately accounting for the cost of producing gas by different processes. In the view of the National Association's committee, however, there was nothing to prevent a set-up of accounts separately for water gas and coal gas production without in any way destroying the essential uniformity of the system nor was there anything to prevent the definite prescription of such accounts by state commissions which might adopt the new classification. The same holds true as to the separation of transmission and distribution property in cases where such separation is a matter of any importance.

The National Association's present classifications differ from the proposed classification of the power commission also in their treatment of certain rental items. As stated in the general instructions relative to income accounts in the gas classification, "The standard form of

income statement established by this system of accounts provides . . . for deducting from gross income all rentals paid for the use of capital not owned . . ."

The Federal Power Commission's accountants propose to include minor rents such as rents for offices, small parcels of land, miscellaneous equipment and facilities, etc., and rents paid to the owner of property used jointly by the company and by others or operated for the joint benefit of the company and others, with the operating expense accounts. If the rental items covered only payment for the use of property, the classification of accounts as originally recommended by our committee would I think be preferable. However, many of these rentals cover other elements so that the treatment of all rentals as deductions from gross income instead of considering any of them operating expense, does not quite accomplish its purpose of showing in the income account the true amount available for return on corporate and leased property, since the deductions include other elements than those of return. For practical purposes there is much to commend the accounting proposed in the system recommended by the power commission's accountants and we have agreed to recommend this treatment to the National Association of Railway and Utilities Commissioners.

In the classifications of the National Association provision was made for an alternative procedure with reference to federal taxes with the idea that some state commissions might permit the inclusion of such taxes as a part of the operating expense accounts while others might require them to be accounted for as a deduction from income. The classification of the power commission includes them all as operating expenses

and we have agreed to recommend a modification of our classification in accordance with this. This is in line with what we understand now to be the law with reference to the treatment of federal taxes on income, as stated by the United States Supreme Court in the *Galveston* case. In any event it can hardly be a serious matter to any of the state commissions since their handling of such items in rate cases is not necessarily determined by the accounting procedure.

There are other details in which it is proposed to modify our classification if by so doing a greater degree of uniformity with the federal classification can be secured, and I anticipate that changes in the gas classification will be made in line with those in the electric classification.

In certain other respects, however, to which I have heretofore alluded, it is not expected that uniformity of accounting with the Federal Power Commission's system can be secured. Those are cases arising from two causes, the first of which is the necessity of the power commission's including in its classification certain accounts which would not be required at all if federal licenses did not exist and which, as I see them, would not be required in any gas classification. The accounting procedure provided by the power commission, for example, for handling donations by individuals or others in aid of construction is more complete and more involved than that embodied in our classification or than there is any occasion to require in so far as the needs of state commissions are concerned. It seems to be made necessary, however, because of certain requirements of the power law relating to fixed capital. The power commission classification also includes accounting procedure for the amortization of fixed

capital as contemplated by the power act out of earnings under certain conditions. There are some other accounts of this general class—accounts which we see no occasion for including in our classification but whose requirement by the power commission will not seriously affect the uniformity of the systems.

The second cause of divergence between the two systems is due to a construction of the requirements of the power law which it is considered requires accounting procedure based on different principles from those prescribed in our classifications and not merely supplementary to our system. These relate largely to the accounting for retirement expense and retirement losses and to the accounting for additions and betterments.

The National Association classification represents a definite breaking away from the old practice of accounting for additions, betterments, and replacements and the adoption of one definite procedure, (1) the credit to fixed capital of the original cost of the property retired with a corresponding charge to the retirement reserve or in some cases to the account property abandoned, and (2) the charge to fixed capital of the new unit of property. Wherever any replacement involves a charge to the fixed capital accounts the old property is first removed from those accounts so that the thing finally resting in the fixed capital accounts should be the property actually in existence. The power commission considers that under the terms of the law it must follow the precedent set by the Interstate Commerce Commission's 1914 classification of road and equipment accounts for steam railways which prescribes an accounting for so-called additions and betterments based upon former

railroad practice but not in harmony with the practices and views of most of the state commissions or with the views of the accounting committees of the gas and electrical industries. In the classifications of the National Association of Railway and Utilities Commissioners additions and betterments, as described in the Interstate Commerce Commission's system, are unknown. As a matter of accounting all property changes such as those constituting additions and betterments in the steam road system, are handled as retirements of the old property and construction of the new.

The power commission's regulations with regard to the handling of so-called depreciation, according to opinion of its counsel, is also made necessary by the requirements of its law. The power commission's regulations regarding depreciation contemplate the maintenance of a reserve sufficient to cover the diminution in value, assuming that such diminution is in proportion to age. The systems proposed for gas and electrical corporations by the National Association of Railway and Utilities Commissioners do not attempt to specify what the basis should be of making provision for retirement losses further than that such losses should be covered by a retirement reserve or, if not so covered, should in some instances be charged to an account called Property Abandoned. It was the thought of those who prepared them that the classifications of accounts should do no more than state the accounting procedure and that the regulatory act of prescribing the basis and amount of provision should be left to the state regulatory bodies or to the discretion of the companies, and not made a part of the system of accounts.

I have made this statement of condi-

tions affecting the classifications and the changes which will probably be recommended in the hope that it would throw some light on the attitude of the state commissions toward the matter of uniform classification. Uniformity of accounting is of course desirable to companies whose properties are scattered over several states and the public utility laws of the various states all recognize the importance of uniform accounting within the state. The laws themselves, however, are usually silent as to any suggestion of uniformity with accounting requirements of other governments or organizations. The tendency toward concentration and consolidation in the utility business, the extension of the interests of single corporations over considerable portions of the country, the increase in the magnitude of the business to be regulated, as well as the importance of being able to make direct comparison between operating results in different sections of the country, all have been forces tending in the direction of nationwide uniformity. The individualistic tendency of state commissions as manifested in some of the earlier classifications of accounts have perhaps been somewhat dulled. Cooperation among the state commissions in transportation matters, in matters involving standards of service, and to some extent in the determination of policies to be followed in rate making, has led naturally to cooperation in the fixing of accounting standards. In attempting to establish uniform systems of accounting by voluntary state action with the cooperation of the industry, one of the first essentials to success has been a willingness to distinguish between those things in accounting which are essential to the administration of state regulatory laws and those things

which are not essential in and of themselves but for which a complete classification must make provision. There has been rather too much of a tendency to impose upon the utilities the views of those who prescribe the systems, even in those matters not important to the carrying out of regulatory functions. There is no reason why, in respects not vital to the success of state regulation, the accounting procedure for the industry should not be rather the product of the industry than of the state commission. The classifications of the National Association of Railway and Utilities Commissioners were founded in large part upon classifications suggested by the electrical and gas associations and in almost all respects they met with the approval of the accounting committees of those associations before being submitted to the Association of Railway Commissioners.

I have stated that there has in the past been too much of a tendency to impose individual views upon the accounting of the industry without regard to whether or not the particular requirements contributed to administration of state statutes. It is important, however, that the classification of accounts under which a regulated industry is conducted shall be adapted to meet the requirements of the regulatory statute and it may be well to **review briefly what the requirements of state commissions are.**

On this question it is unlikely that full agreement could be reached, because of individual differences of opinion but, generally speaking, state needs in public utility accounting are created by statutory requirements that rates be reasonable and that security issues be not inflated. In the earlier days of state regulation engineering appraisals were the

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principal sources of information as to property values. Such appraisals were necessary because book values were often inaccurate and not substantiated by available proof. As time went on and utility properties grew enormously the impossibility of keeping valuations up to date by actual appraisals became very clear. Physical valuation of all utilities, though probably contemplated by many utility laws, is an impossibility, with present or prospective appropriations for such work, except perhaps as a gradual accomplishment over so great a period of time that the processes of regulation cannot wait on its fulfillment. Correct accounting for property additions and retirements has proved essential to the successful administration of state laws because such accounting furnishes the only practical means of keeping the cost element of valuations up to date. One of the most serious attacks which regulations has had to meet resulted from the delays which were unavoidable when commission decisions could not be issued until physical valuations had been completed. In some cases years were consumed by these unavoidable delays. It is doubtful if repetition of such conditions would be tolerated. The continuance of regulation is dependent in large measure on the elimination of delay. It has not been uncommon for state commissions to handle several hundred rate cases in a single year. If book records of property changes could not be used in such cases the machinery for establishing and adjusting rates on a fair basis would be almost stopped and delays would be unbearable.

In the early days of state regulation the test of success or failure of rate control was largely a qualitative one. Prices were fairly stable and no great flood of

cases had to be disposed of. Conditions growing out of the war changed all this. At least in some states, practically every utility came before the commission for rate revision. Prices changed so rapidly that delay would have meant financial disaster, even if rapid dispatch of the work had not been necessary to prevent excessive accumulation. Correct records of property changes were one essential to prompt disposition of cases. Even more important were correct current records of revenues and expenses, so classified as to permit of ready analysis and comparison. Price increases were so extreme that in some cases value of property became of secondary importance because at the best utilities could not hope for a normal return on full value. Also operating expenses of previous years were useful as an indication of the effect of changed prices rather than as a basis upon which rates could be established. The most important records were those of months just past and in many cases even these were inadequate. Then the reasonableness of commission action depended upon the correctness of the recording and classifying of expenses in the past and the ability to adjust such expenses to reflect price levels which might not yet be fully shown on the books for any accounting period but whose imminence made their consideration unavoidable. Without a reasonably correct record and classification of utility expenses commission regulation of rates would have met even a more severe test than that to which it was subjected, if it had not broken down altogether.

The immediate importance of rate regulation has sometimes resulted in a tendency to overlook or at least to subordinate another principal purpose of

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public utility regulation whose accomplishment is dependent on correct accounting. This is the supervision of security issues. Here again it is impracticable to depend on engineering appraisals, because of the magnitude of the job which makes it impossible to secure up-to-date appraisals in all cases. Correct accounting for property changes and for discount and expense incurred is a necessity on which I need not elaborate. Not all authorities agree that public utility security issues should be regulated by the states but the acceptance of the principle as a part of public utility control has been so general that state commissions must recognize the importance of proper accounting in relation to its application.

Other aspects of the relation of accounting to the success of state regulation might be mentioned but I am not attempting to make a complete review of the situation. No state commission can do less than insist that the accounting classification which it adopts should be one which will furnish, as directly as possible, the information necessary for its proper activities. The commissions, however, are required to do more than this by state laws which direct them to establish classifications of accounts.

The interest of state commissions in a great many features of classifications of accounts for utility companies cannot be related to any of the necessities

of regulation and may appear to be merely academic, but they are required to establish complete and, generally, exclusive systems. Only in the last few years have the means of effective co-operation between accountants of the industry and those of the states been developed so that classifications might be written which would reflect at all points some real accounting need. Many of the state classifications served their purpose well. Others were seriously defective in important respects. The new classification, with such amendments as may be made to maintain uniformity of general structure with the electrical classification, is intended to be the means of furnishing information needed by regulating commissions and by gas corporations. I believe it will come close enough to fulfilling this purpose to justify us all in urging its adoption.

That it will be found lacking in some respects is altogether likely and though we urge its adoption we must be prepared to accept changes which serve a real purpose. As far as we can see now, the gas corporations must work with accounting systems prescribed by the states for a long time to come. If the same degree of cooperation which has made possible the present classification can be maintained no serious difficulty can result from the necessity of making amendments from time to time.

A Good Investment

For \$75.00 the Association will sell outright to its members a print of its latest motion picture film entitled "Around the Clock with Gas." This price includes more than 1,000 feet of the most interesting gas film ever photographed, together with reel, container and shipping case.

This offer should be of particular interest to holding companies and to other companies operating in large territories, where the film could be used continuously for a period of several months.

ADVERTISING SECTION

B. J. MULLANEY, Chairman

J. M. BENNETT, Vice-Chairman

CHARLES W. PERSON, Secretary

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Our Program for 1923

AT an enthusiastic meeting of the new Managing Committee of the Publicity and Advertising Section, held at Association Headquarters on November 22, plans were outlined for the section's work during 1923.

Present activities carried on by the section will be continued and in some cases considerably enlarged. These include the distribution of the new film "Around the Clock with Gas," the publication of educational and good will booklets, the most recent of which is "Hints for the Housewife"; the Association's illustrated lecture on the gas industry, the new advertising copy service, which is now used by 215 companies and is steadily gaining in favor; the frequent preparation of newspaper and magazine articles, and cooperative work maintained with the state committees on public utility information, 18 committees now operating and extending their activities into 26 states of the union.

During the coming year the section will continue to agitate for the employment of experienced newspaper or advertising men by gas companies, to the end that public relations work may be placed in the hands of persons capable of bringing about an intimate contact between the company, the press and the public. A special committee was appointed by Chairman Mullaney, charged with the duty of investigating the situation and of defining specifically the place of a public relations man in the gas company's organization.

An effort will be made during the ensuing year to have the manufacturer company members of the Association include in their general advertising such facts relating to the gas industry as will tend to create a greater appreciation of gas service. Committees of this section and the manufacturers section have been appointed to formulate ways and means by which this result may be accomplished.

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The need for immediate action in the effort to cause the piping for gas service of residential and business structures is apparent to the section and some progress along this line by means of direct-by-mail literature and advertising may be expected very soon in cooperation with other sections.

Another activity to be engaged in by the section will be the Public Utilities Advertising Association of the Associated Advertising Clubs of the World. A substantial representation of the industry's advertising men is desired in this new movement and an active membership campaign will be started shortly.

A recapitulation of clippings from newspapers and trade magazines showed that this year's convention of the Association was more widely and voluminously commented on than any previous convention. Such a record as this gives unerring proof of the increasing interest now being shown by the public in the gas industry and in all matters pertaining to its development. Not only did trade magazines representing industries closely allied with our own call on the section for full accounts of the annual meeting, but requests came from England and other countries.

Another encouraging feature of our convention publicity this year was the cooperation rendered by our members in

getting their local newspapers interested. Not only were articles placed in the newspapers prior to the convention's opening, but members after returning home were so enthusiastic that they secured further valuable publicity, thus swelling this year's total of press comment to a record never attained before.

The public's interest in an annual gathering of gas men is so great that the large press associations now ask for full copies of all convention papers two weeks before the convention, in order that a complete account of what takes place may reach editors in ample time to be published coincident with the sessions.

Impressed by publicity results received this year and by the increasing number of requests for general information about the industry that come from editorial offices, the section urges that companies lay more emphasis on purely good will and informational advertising and increase their advertising appropriations accordingly.

An investigation will be made of company advertising this year to determine what proportion of gross receipts are devoted to this purpose, and when these figures are in hand a definite recommendation will be made to the industry that a certain percentage of gross receipts be set aside for advertising.



At the meeting of the Executive Board held on November 23, 1922, H. S. Schutt, Philadelphia, Pa., was elected to the Board to fill the vacancy caused by the election of J. B. Klumpp to the Vice-Presidency.

Editorial Echoes from the Convention

A little discreet advice of no uncertain tone was handed to members of the American Gas Association at their convention, anent the subject of advertising. It is refreshing and encouraging to hear from the ranks of an industry that has been a stubborn pupil in study of that subject, plain truths that indicate a well learned lesson.—*Sun*, Paducah, Kentucky.

Scientists in the American Gas Association are trying to make gas with a bad odor so that it can be detected easily when there is a leak. If they'll come to Cleveland we'll lend them a few stockyard odors to experiment with.—*Press*, Cleveland, Ohio.

The average housewife takes 2,113 steps to cook three meals a day and 1,592 of these steps could be saved by modern equipment properly arranged, according to experts attending the Gas Association convention at Atlantic City. Evidently it is meant that the husband should step a little livelier as a provider.—*Ledger*, Gaffney, S. C.

If we are to accept the view of the gas producers there is no saturation point in sight for the sale of their product. Though Americans in ten years have used three times as much as in the previous decade, Dana D. Barnum, president of the American Gas Association, says the industry faces the greatest development in its history as the consumer turns from coal fuel.—*Financial America*, New York.

Incidentally, the Denver plan for the use of gas in the heating of houses serves to call attention to the survival of the gas plants at a time when electricity has almost entirely supplanted gas as an illuminant. Time was when it was predicted that there would soon be no demand for gas, but new uses were developed, especially its employment for cooking. Now other and greater possibilities are suggested.—*Transcript*, Boston, Mass.

"Gas Users Safer Than Pedestrians"
—Head line. Users of illuminating gas, of course.—*Inquirer*, Philadelphia, Pa.

For an odorous agency, one scientist suggests ethyl-mercaptan be mixed with the gas. Another advocates phenylisocyanid. Which shall it be? Not the first, please, because its smell is said to be that of the polecat. The second is said to give people a tremendous appetite. Imagine boarding house keepers having anything so dangerous as that about their premises. Let the chemist suggest another odor.—*Herald*, El Paso, Texas.

The fact that such men as prominent lawyers, editors of great dailies, members of public service commissions, and certified public accountants came from distant points to address the convention is convincing testimony of the importance of our business, and of the public need of our service.—*U. G. I. Circle*.

Most American women live and have to carry on their work as housekeepers

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in houses about which arrangements they have not been consulted. Men, whose idea of a house is a place in which to eat and rest, have done most of the house-planning and house-building without even taking much trouble to find out what the convenience of the women required.—*Standard*, New Bedford, Mass.

Successful merchants have long ago realized the importance of newspaper advertising, but, as a rule, public utilities have not deemed continuous newspaper advertising necessary to the proper conduct of their businesses. It is gratifying to note that they are now working up to its importance as a factor in that line.—*Times*, St. Petersburg, Fla.

Mr. Richardson's advice to the gas men is good. There are facts about every business that would go to make good news "stories" and which the newspapers would welcome as such. Every day there are happenings in and around a business house that have a news value which the newspapers are not able to get. These things appearing in the news columns of a newspaper not only help the paper, but also help sell the concern's goods and build up a good will. No news may be good news, but it certainly is bad advertising.—*Intelligence*, Wheeling, W. Va.

We may yet be taking referendums to decide how we want our fuel and lighting gas perfumed. Husband and wife may be estranged over the question of whether the gas is to be scented with Djer Kiss or essence of cognac, and lobbyists of Richard Hudnut and Palmer will besiege our city council chambers.—*Commonwealth*, Fond du lac, Wis.

The miners and their officials will do

well to bear in mind that a nation of a hundred million people will not long allow itself to be dominated by any group of individuals claiming to possess an economic strangle hold upon it. There may be a universal resort to some other fuel.—*Traveler*, Boston, Mass.

The drawbacks to the Denver experiment, granting that cheap gas is a possibility in the near future, lie in the necessity for a tremendous expansion of plant to take care of a consumption seasonable in its nature and in the laying of larger mains for its proper distribution. These are reasons why many gas engineers are reluctant to see the development of a "heating load." But they may be won over; they may have no choice, as the president of the Boston Consolidated Gas Company contemplated in declaring that, if the demand comes, it must be supplied.—*Evening Bulletin*, Philadelphia, Pa.

At the meeting of the American Gas Association, a paper was read on "Selling the Gas Bill." The art of raising it might, perhaps, have been made the subject of another contribution.—*Transcript*, Boston, Mass.

Mr. Doherty had to tell the benighted members of the Association how luxurious it is to burn gas and be without smoke, but he would not need to enlarge on that truth to any one who lived in Muncie in the nineties, when natural gas was the fuel and the skies were blue and smoke palls over the city unknown.—*Star*, Muncie, Ind.

The store that does not fall for every advertising scheme, programs, pamphlets and the like, and advertises consistently

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in the home town newspapers, backed up with the goods, is generally the store that wins out when it comes to business and good will.—*Patriot*, Quincy, Mass.

Now it is Alanson P. Lathrop, president of the American Light and Traction Company, who takes a drive at tax-exempt bonds in which hundreds of millions of dollars are invested without the government's debts profiting from them one penny.—There's something to ponder over in leisure moments.—*Press*, Atlantic City, N. J.

The demand of so-called smaller industries for fuel gas, a feature in the expanding field of gas in manufacturing noted for a long time, continues to be manifest.—*Journal of Commerce*, Chicago, Ill.

What a relief it would be if, when winter comes, one had only to go down cellar and light the gas. We could leave the stoking to the experts at the gas plant. And, above all, we should never have to worry about empty coal bins. Good luck to Mr. Doherty!—*Globe*, Boston, Mass.

During the next two years, the American Gas Association predicts, the gas industry will carry on a tremendous building program in the financing of which there will be needed hundreds of millions of dollars of new capital.—*Record*, Philadelphia, Pa.

Henry L. Doherty announces that he will heat 100 Denver homes with manufactured gas this winter "at a cost that

will compete with coal." That may be the solution of the coal problem—shipping it to central distribution points, converting it into coke, then sending the by-product gas to consumers through a network of pipe lines covering the country like a spider's web.—*Times-Call*, Racine, Wis.

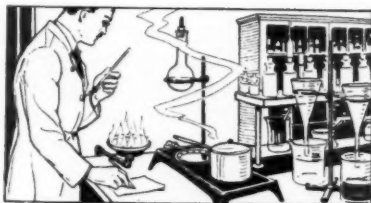
In Canada many of the public utility companies have come to realize that earning the good will of the public is just as important as selling the product, and that, even in the case of a monopoly, the latter depends very greatly upon the former.—*Marketing*, Toronto, Canada.

Vice-President Calvin Coolidge said something worth remembering when he told the gas men gathered in convention in Atlantic City that all attempts to shift the burdens and responsibility of citizenship upon the government is "a perversion of self-government, which holds to the principle that the government does not make the people, but the people make the government."—*Post*, Boston, Mass.

The Denver experiment will arouse a great degree of interest because of the possibilities it holds; heating by gas possesses some attractive features.—*Times*, Barre, Vermont.

The American Gas Association sarcastically refers to Napoleon's remark that gas was "a big folly." But maybe Heat wasn't the kind of gas he meant after all, for he was a man of action and despised hot air.—*Topics*, Cleveland, Ohio.





Why the New Gas Standard Is More Efficient

WORKING in their laboratories under perfect conditions, chemists have absolutely proven the following facts about gas which should be considered carefully as a whole:

1. The higher the B.T.U. (heating) value of gas, the greater amount of air must be admitted through the burner adjustment to obtain efficient combustion.
2. The cooling effect of nitrogen in this additional air counterbalances any extra flame temperature obtained from the additional B.T.U. value of the gas during combustion.
3. The heat efficiency of the present standard gas for domestic purposes is only 14 to 16%.
4. "Flame temperatures depend more upon the correct adjustments of Gas and Air, than upon the heating value (B.T.U.) of that particular gas."

Authorities: 1-3—A. J. Hewitt, Toronto, Canada.

4—Public Utilities Report 1910, page 106, New Jersey, Rate Case.

Practical results from gas for domestic purposes do not depend entirely upon B.T.U. contained in the gas, but upon the ability of the burner to completely utilize all the heat units available in the gas, and upon the flame temperature resulting from this combustion. Consumers generally are familiar with the gas mantle which occasionally turns black. Likewise, the housewife objects to the soot deposits on the bottom of pots and pans. This is caused by the incomplete burning of our present standard gas. It will be more practical to adjust the modern burner for the new standard gas in order to get economical service, than it is with our present standard.

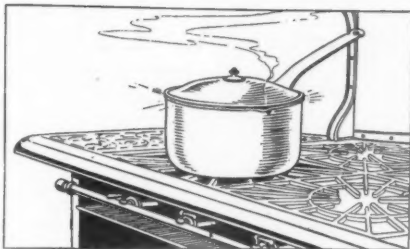
Watch for Advertisement No. 3 of this series—"Canada's Experience with 450 B.T.U. Gas and No Higher Bills."

Utica Gas & Electric Co.

Any consumer wishing to discuss this matter in further detail will be welcome at our office, 223 Genesee St., Utica. Communicate with the Commercial Department.

Advertisement No. 2 of a Series

A difficult subject to advertise but Utica, New York, is doing it successfully.



How Much Gas Is Required to Cook a Kettle of Potatoes?

HOW long does it take to cook a kettle of potatoes in the average home? Possibly a half hour after the water begins to boil. Quite naturally the housewife wants to know "With the new standard, can I cook potatoes in the usual half hour? Will I use more gas to do this, than I did with the old standard?"

Heat boils your water and cooks your food. To obtain this heat a high flame temperature is required. This high flame temperature is obtained only through a correct mixture of air and gas.

To secure a satisfactory mixture, the burner must be adjusted for every material change in kind or quality of gas. Recent tests show that the adjustment required to get the full value with gas of existing standard is difficult to obtain with modern burners.

With the new standard, we will adjust your burners so that you will obtain the proper mixture. This adjustment will be made at the proper time without cost to you. As a result, you should use no more gas, and it should take no more time to cook your meals or heat water with the new standard than it did with the old.

Watch for advertisement No. 5 of this series, which tells what we are doing to improve our service.

Utica Gas & Electric Co.

Any consumer wishing to discuss this matter in further detail will be welcome at our office, 323 Genesee St., Utica. Communicate with the Commercial Department.

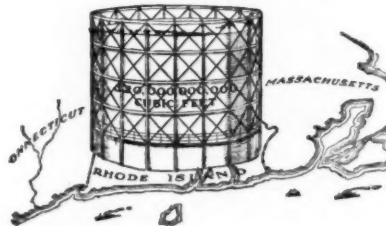
Advertisement No. 4 of a Series

The plain "potatoes" of the whole question—expressed in language that can be understood.

DAILY EVENING ITEM—LYNN, MASS.—MOVING PICTURE SECTION

America's Favorite Household Fuel GAS=ELECTRICITY

LYNN GAS & ELECTRIC CO.



To Our Customers:—

Gas used by the American people in one year (320,000,000 cubic feet) would fill a tank 15 feet high the size of the State of Rhode Island. Over 7,000,000 American homes use gas. America's ability to make gas right and deliver it when and where they want it, together with American housewives' way of using it right, offers gas to the home as the best and most economical fuel known. Such a collection of fuel does not interest you, however, you will be interested to know that right here, in your own city, your Company maintains an intricate system of producers for manufacturing gas, with five holders or tanks with a total storage capacity of (8,800,000 cubic feet), with 250 miles of street mains, with more than 25,000 services leading from our mains, to which 35,000 consumers are supplied.

The Electric Department, supplying 17,000 consumers, requires 570 miles of overhead wire and 250 miles of underground cable. Your company, capable of supplying your demands, requires a plant that covers over 25 acres, of which 7 acres are covered with buildings.

Gas and electricity must be made available for our consumers day and night, 365 days in the year. Our unbroken record for courteous service is your assurance that we shall leave no stone unturned to live up to our slogan

At Your Service

Our duty to our patrons is to render the best possible service. We try to live up to the standard we have set in the slogan which we have adopted.

We would appreciate from our patrons suggestions that would help us to render more efficient and better service. Our patrons' co-operation is earnestly desired.

Equipped with every advanced scientific appliance for the economical production of gas, we have provided for the rapid growth of our prosperous city for years to come. Lynn enjoys the highest grade gas for domestic and commercial purposes, made in accordance with the Massachusetts Standard, which is the most exacting. Our electrical power plant is ample to provide light and power to meet the future growth of the city for years to come. Lynn is a good city to locate in and extends a cordial invitation to all industries and prospective home builders to take advantage of the opportunities which it offers.

John S. Bartlett, President
Menzah P. Clough, Vice President

Henry K. Morrison, General Manager
Eugene B. Fraser, Treasurer

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LYNN GAS & ELECTRIC CO.

An advertisement of marked originality and effectiveness, with an intimate message on service.

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CRANE, WM. M., New York, N. Y.
DE HART, JR., J. S., Newark, N. J.
DICKEY, E. S., Baltimore, Md.
GREENE, J. J., New York, N. Y.
KNAPP, F. H., Pittsburgh, Pa.
MAXON, H. R., Muncie, Ind.
MCDONALD, DONALD, New York, N. Y.
NORMAN, E. A., New York, N. Y.
ROBERTS, EARL W., Detroit, Mich.
SIMLER, O. P., Lorain, Ohio
STITES, TOWNSEND, Gloucester, N. J.
TAPPAN, W. H., Mansfield, Ohio.

Representing Affiliated Societies

ABBOTT, M. E., Taunton, Mass. (Gas Sales of N. E.)
BARTLETT, C. E., Philadelphia, Pa. (New Jersey)
BARTLETT, C. E., Philadelphia, Pa. (Pennsylvania)
CREVISTON, A. E., Baltimore, Md. (Southern)
GIBSON, W. R., Toronto, Ont., Can. (Canadian)
HAMMOND, E. W., San Francisco, Cal. (Pacific Coast)
MCCELLOCH, CHARLES, Milwaukee, Wisc. (Wisconsin)
NORTON, ARTHUR E., Boston, Mass. (N. E. Gas Eng.)
PARKER, JOHN F., Rockford, Ill. (Indiana)
ROPER, GEO. D., Rockford, Ill. (Illinois)
ROPER, GEO. D., Rockford, Ill. (Iowa)
SEIDENGLANZ, C. H., Dallas, Texas (South Central)
SMITH, W. L., Battle Creek, Mich. (Michigan)

CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Exhibition—F. A. LEMKE, Kalamazoo, Mich.

Nominating—J. S. DeHART, JR., Newark, N. J.

Division of Accessories Manufacturers—EARL W. ROBERTS, Detroit, Mich.

Division of Apparatus & Works Manufacturers—D. J. COLLINS, Philadelphia, Pa.

Division of Gas Range Manufacturers—W. H. TAPPAN, Mansfield, Ohio.

Division of Heating Appliance Manufacturers—E. P. BAILEY, JR., Cleveland, Ohio.

Division of Industrial Appliance Manufacturers—H. R. MAXON, Muncie, Ind.

Division of Lighting Appliance Manufacturers—TOWNSEND STITES, Gloucester, N. J.

Division of Meter Manufacturers—DONALD MCDONALD, New York, N. Y.

Division of Office Labor Saving Devices—E. A. NORMAN, New York, N. Y.

Division of Water Heater Manufacturers—O. P. SIMLER, Lorain, Ohio.

Division of Supply Manufacturers—J. J. GREENE, New York, N. Y.

The Outlook

OUR 1922 convention was the biggest ever held in the industry.

Sales of manufactured gas in 1921 set a new high record.

These are the prophets pointing the way to the coming "Gas Era." We have not reached our zenith, our sun is still rising.

The enormous unsold field for gas burning appliances of all kinds tells us our work has just begun.

Unusual conditions, as the fuel situation add to the demand for gas and appliances.

As a result of efforts in the past the manufacturers are now in a position to take advantage of these opportunities.

After a hard fight they find themselves on a sound and prosperous footing, well able to take care of all demands made on them for increased production. With the promise of bigger business and the increasingly important part played by the manufacturers, their responsibilities toward the industry become greater. They cannot rest on their laurels. The big stick of good advertising must continue to be used with its resultant good effect. To assure their future standing their products must be appliances of quality.

At the meeting of the managing committee of the section at association headquarters, November 22, our chairman

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forcefully brought out the opportunities that are presented to the chairmen of our various divisions for initiating programs of value to the members of their divisions and to the industry as a whole.

The association "Idea" is founded on the premises that by the exchange of experiences we progress and by cooperative endeavor we realize our purpose. To better perform our function a 100 per cent membership is the ideal to work toward. One large family, each member imbued with the belief that whatever benefits the industry, whatever creates a better "good will" toward the industry must of necessity be an asset to himself.

We manufacturers, as an important branch of the gas industry, must direct our individual as well as collective efforts toward keeping our present membership in line and increasing it to the 100 per cent mark.

The present time is propitious for such efforts. Business conditions are generally improving and promise greater improvement from month to month. Manufacturers facing the pleasant pros-

pect of enjoying more profits cannot refuse to help support, through membership, the association whose interests are their interests.

Our chairman recommended that our section develop a closer relationship with the commercial and advertising sections. Such a relationship cannot but be of great benefit to all concerned. With these views in mind and appreciating the unexcelled opportunity for inscribing the word gas and what it stands for across the page of progress, let us start the new year confident in the belief and strong in the determination to see our purposes realized.

Another thought. You have read thus far, there are many others who have done likewise. You either agree or disagree with what has been published. What better medium is there for the disseminating of your opinion among those who are also interested than the pages of this book and where can a more appreciative audience be found than among the readers of the A. G. A. Monthly. The section earnestly invites your contributions for publication herein.



Wanted:—Sales Literature and Catalogues

In the preparation of copy and illustrations for the Association's monthly advertising service, we find the sales literature and catalogues issued by our manufacturer company members to be of great assistance to us.

For example, we want to feature and concentrate upon the same selling points that are being emphasized by our manufacturers in their most recent literature, while the artists who prepare our illustrations are sure to produce drawings of accurate and up-to-date detail if they have recourse to recent catalogues and other literature.

If you have issued any new literature within the last six months, send us a copy. Also check up and make sure that we are on your mailing lists for such material.

More than two hundred member gas companies are subscribers to our advertising service. They deserve the very best that we can give them.

COMMERCIAL SECTION

WILLIAM GOULD, Chairman

LOUIS STOTZ, Secretary

J. E. DAVIES, Vice-Chairman

MANAGING COMMITTEE—1923

At Large

BARNES, CYRUS, Boston, Mass.
 BARTLETT, C. E., Philadelphia, Pa.
 COLLIER, WILLIAM, Poughkeepsie, N. Y.
 DUTTON, L. R., Jenkintown, Pa.
 EVES, PHILMER, New Haven, Conn.
 HANLAN, J. P., Newark, N. J.
 HUMPHREY, H. E., New York, N. Y.
 JONES, J. B., Bridgeton, N. J.
 KAHN, B. B., Hamilton, Ohio
 KNAPP, F. H., Pittsburgh, Pa.
 MACSWEENEY, J. P., Rochester, N. Y.
 MILENER, E. D., Baltimore, Md.
 MURRAY, J. J., Biddeford, Me.
 MYERS, J. B., Philadelphia, Pa.
 NEWMAN, H. H., Trenton, N. J.
 POLIETT, L. I., Baltimore, Md.
 POST, A. P., Philadelphia, Pa.
 QUINN, J. J., Quincy, Mass.
 RASCH, W. T., New York, N. Y.
 SMITH, D. R., Baltimore, Md.
 STANNARD, C. N., Denver, Col.
 STEPHANY, E. J., Pittsburgh, Pa.
 STETSER, J. R., Gloucester, N. J.
 TAYLOR, J. D., Baltimore, Md.

Representing Affiliated Societies

BURKE, E. J., Indianapolis, Ind. (Indiana)
 CORLE, W. F., Mexico, Mo. (Missouri)
 CRAFTS, H. C., Pittsfield, Mass. (N. E. Gas Eng)
 CRANKSHAW, J. W., Allentown, Pa. (Pennsylvania)
 CRAWFORD, H. M., San Francisco, Cal. (Pacific Coast)
 DOERING, H. A., Mt. Vernon, N. Y. (Empire State G. & E.)
 FLAATT, J. J., New Orleans, La. (South Central)
 GOSS, A. J., Ottumwa, Ia. (Iowa)
 HANLAN, J. P., Newark, N. J. (New Jersey)
 JOHNSON, W. B., Toronto, Can. (Canadian)
 LEARNED, J. G., Chicago, Ill. (Illinois)
 McDONNOLD, H. E., Greenville, S. C. (Southern)
 SCHROEDER, A. G., Grand Rapids, Mich. (Michigan)
 ST. JOHN, JOHN, Madison, Wis. (Wisconsin)
 WILLARD, E. A., Portland, Me. (Gas Sales of N. E.)

CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Cooperation with Architects and Builders—R. S. DOULL, New York, N. Y.

Cooperation with the Plumber and Heating Dealer—F. H. KNAPP, Pittsburgh, Pa.

Home Economics Service Bureau—PHILMER EVES, New Haven, Ct.
 Industrial Gas—E. J. STEPHANY, Pittsburgh, Pa.
 Retail Pricing—A. P. POST, Philadelphia, Pa.
 Sales Stimulation—J. E. DAVIES, Chicago, Ill.

Our Program for 1923

THE first meeting of the Managing Committee of the Commercial Section was held at Association Headquarters on November 22nd. A policy of concentration of effort upon such essential matters as offer opportunity for some definite accomplishment, and which would be particularly helpful to the smaller companies, was agreed upon.

A plan was submitted and approved, with the endorsement of Mr. Lemke on behalf of the Manufacturers' Section, whereby the manufacturers' field representative will be requested to aid in having the plans suggested by the sales stimulation committee adopted and put into operation by the gas companies. The

sales stimulation committee will continue to prepare in detail sales plans during the year which will be offered for the guidance of gas company sales departments.

Committees were appointed to bring about a closer relationship and better understanding between the architects and builders and between the plumbing and heating dealers and the gas companies. This work will be undertaken through the cooperation of the American Institute of Architects, the National Association of Master Plumbers and the National Trade Extension Bureau.

A committee was appointed to work out some feasible plan for the establish-

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ment of home economic service bureaus as part of the gas company activities. This committee will assist gas companies in organizing and putting into operation such departments and act in an advisory capacity in all matters pertaining to such an activity.

An industrial gas committee was appointed with full power to arrange plans whereby the industrial engineers and salesmen shall have full opportunity at the annual convention for discussion of their particular problems. The committee will also do everything possible to interest the manufacturers of industrial appliances to exhibit at the time of the convention. It will be the duty of the committee in every way possible to stimulate interest in the industrial fuel field and assist member companies in getting this attractive business on their books.

Increasing gas merchandise sales per meter per year was a subject which was carefully discussed and directly connected with this, the subject of standard specification appliances was considered. It was the sense of the managing committee that all gas companies should agree to handle only gas merchandise which is built strictly in accordance with A. G. A. specifications wherever such specifications exist or may be later adopted and the following resolution

was adopted and submitted to the Executive Board for approval:—

"WHEREAS, the Managing Committee of the Commercial Section believes that gas appliances should be quality goods, constructed with first regard to safety, efficiency and durability in order that they may render the best possible service and satisfaction to their users, and

"WHEREAS, the standard appliance specifications of the American Gas Association provide for these essential features in gas appliances,

"RESOLVED, that the members of this Managing Committee hereby agree to recommend for purchase and resale only those appliances constructed in accordance with the standard specifications so far as they exist or may be later adopted and marked by tag, badge, or imprint of such kind as the manufacturers may prefer, with the words 'Constructed in strict compliance with the standard specifications of the American Gas Association,' and that they earnestly recommend similar action by all members of the Commercial Section of the American Gas Association, and further, they recommend that this resolution be approved by the Executive Board and by its order transmitted to the gas appliance manufacturer members of the Association."

EVERY SALES MANAGER SHOULD HAVE THE MERCHANDISING BULLETIN ISSUED BY THE SALES STIMULATION COMMITTEE—

SALES SUGGESTIONS FOR JANUARY-FEBRUARY AND MARCH.

SEND FOR A COPY TO-DAY.

Sales Suggestions for January, February and March

Proposed by the Sales Stimulation Committee

Increase Your Off-Peak Merchandise Sales

AFTER the wave of generous Christmas holiday spending there always follows a period during January, February and March when people are very careful of their expenditures, particularly for such articles as are not strictly necessities.

The department stores are keen merchandisers and quick to sense a condition of this kind and they take advantage of the opportunity to stimulate this off-peak business by January "white goods sales," February "furniture sales," etc.

It has been the experience of many gas companies who have made special inducements to stimulate gas merchandise sales during January and February that such a plan does bring most excellent and profitable results.

The advantages to a gas company of securing such off-peak business are quite obvious. It keeps the shop force busy, increases gas sales and affords opportunity to clean out accumulated stocks.

The Sales Stimulation Committee of the Commercial Section, therefore, recommends to all member companies the following suggestions as a guide and help towards straightening out the gas merchandise sales curve for the year.

Three Special Offers During January, February and March

It is a well recognized fact that it is better business to hold good merchandise paper than to have stock on hand, there-

fore, as a real inducement to encourage gas merchandise purchases agree,—

1st. Accept \$2.00 as the initial cash payment with order.

2nd. To extend the time payments over as long a period as possible.

3rd. Offer some premium which would be given with purchase of your higher priced permanently connected gas merchandise; that is with a cabinet gas range, storage water heater, radiant fire, etc., etc. Premiums could be selected from such articles as:

- Enameled kitchen table.
- Set of aluminum ware
- Set of dishes
- Kitchen cutlery set
- Set of silverware
- Ironing board
- Kitchen stool.

Special Price for Double Sale

A plan which has been successfully used is that of offering a special price to the purchasers where a double sale is made. This is somewhat in the nature of a club plan and would have a tendency to make a double sale where ordinarily but one sale might be made. As an example, assume your price on a cabinet range is \$50, offer to sell two at say \$90. The effect would be that a customer who has decided to buy a range would endeavor to get some neighbor or friend to join with her and between them buy two ranges.

The Split-Tag Idea

The split-tag idea offers your salesmen

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an opportunity to approach a prospective customer. The tag is left with the prospect by the salesman who turns in the stub to the office and this will be a check in case the prospect later visits the office and makes a purchase. Leaving the tag with the customer is a constant reminder of the special terms and premium offer made by the company and is apt to induce that prospect to make a purchase before the expiration of the campaign.

Inducements to Salesmen for Cash Sales

As an extra inducement for your salesman to make cash sales, offer them an additional one per cent commission on all sales made for cash instead of the time payment sale.

Inducement to Employees to Turn in Prospects

Work out a schedule of cash or premium offers to the employees other than the salesmen who turn in prospects which result in sales.

This can be done by giving a certain number of credit points for various types of appliances, the employees receiving the highest number of points to be awarded a monthly cash or premium prize, cash sales to receive more credit points than time payments.

General Suggestions

During the discount period for paying gas bills is an opportunity to increase your floor sales. The cashier should be instructed to call the attention of each consumer to the company's special offer and at the same time hand out a printed slip giving the details of the offer.

A special prospect list could be made up of all customers whose monthly bills average 2,000 cubic feet or less. Have

the sales force work on these prospects intensively for they offer possibilities for making merchandise sales and increasing gas consumption.

Keep in touch with all building permits and contracts, also electric wiring contracts in your community and immediately follow up the architect, electrical contractor, builder and owner in an endeavor to have gas piping and necessary outlets installed for side brackets, base board and fireplace outlets.

Nothing is so important as having your entire organization interested and working as a unit. Every employee should be informed of your sales and publicity plans and special inducements to employees. Have a general meeting and go over the details of your plans supplying them with copies of your advertisements, special notices and sales talks.

Advertising Copy

Members are referred to the A. G. A. Merchandise Advertising Copy Service which is now being sent monthly to over 200 subscribing gas companies. This service consists of one "good will advertisement," four "chat" ads, and eight distinctive and original pieces of gas merchandise copy. All the merchandise copy is illustrated.

Window Displays

These are a most effective help in selling and particular attention should be given to making your windows attractive and tell your story.

Assistance from Manufacturers' Representatives

The manufacturers of gas appliances have been requested to co-operate in this business getting movement by having their sales representatives assist the gas companies. It is believed that such co-

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operation will be mutually helpful to the gas companies and the manufacturers.

The sales stimulation committee will appreciate some expression from the member gas companies which will give

assurance to the committee that the suggestions offered, at least in part, will be adopted. Suggestions for future sales activities will be welcomed from the membership.



A Gas Company's Contribution to the Better Home Movement

ADA BESSIE SWANN, Director Home Economics Department,
Public Service Gas Co., Newark, N. J.

OCTOBER 9th to 14th was nationally "Better Home Week" for America. The motive of the movement was to interest people in better homes and better homemaking through simple, practical and economical suggestions.

In order to do this to the best possible advantage, a house was selected and furnished and opened to the public each afternoon and evening. Furnishings were chosen throughout the house which would combine simplicity and practicality with comfort, convenience and quiet beauty and many labor saving ap-

pliances, both gas and electric, were installed.

The quiet, restful, cosy, warm, comfort of the living room attracted keen interest. This very comfort and cheeriness was dispensed by a radiant type fireplace heater, connected solidly in the red brick fireplace. Its dignified beauty added greatly to the charm of the living room and also to the sun parlor where a smaller type fireplace heater was installed. On chilly days these heaters were lighted and through this means of auxiliary heating the attractiveness and



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usefulness demonstrated by the use of the fireplace heaters was greatly commented upon by some 15,302 visitors.

Especially those people who were contemplating building were interested to learn that for the expenditure of a small sum at the time of building, gas pipe could be run to the fireplaces to provide a convenient gas outlet for connecting a gas fireplace heater.

In the kitchen of the Better Home an all white enamel gas range with Oven Heat Regulator was installed and each day the story of "Time and Temperature" cooking was told the many visitors.

The hot water heating system originally installed in the home by a plumber was a tank circulating water heater, connected to a boiler in the basement. This meant that every time hot water was needed a trip must be made to the basement and then it was several minutes before hot water could be had. The company considered that the type of house

chosen as this Model Home, required a storage heating system. So, for the period of the exhibit, they disconnected the tank water heater and installed a modern storage hot water heater system. So much interest was shown in this feature of the exhibit that it was necessary to have someone in the basement at all times to answer questions and demonstrate.

Finally, in the electrically equipped laundry, a two burner laundry stove was installed and a gas heated ironing machine.

Every piece of gas equipment placed in the model home for the exhibit period was bought by the owner of the home before the exhibit had closed and many orders for other such installations were taken.

The first day or two the exhibit was opened, I felt that the basement where the appliances of greatest use in making the home efficient, were on display, was not receiving the attention that it should.

(Continued on page 59.)



TECHNICAL SECTION

F. C. WEBER, Chairman

H. C. WEHNERT, Vice-Chairman

H. W. HARTMAN, Secretary

MANAGING COMMITTEE—1923

At Large

BATES, M. M., Chicago, Ill.
BECKJORD, W. C., New York, N. Y.
BURDICK, R. H., New York, N. Y.
COOK, JR., H. R., Baltimore, Md.
EATON, H. M., Detroit, Mich.
FIELDNER, A. C., Pittsburgh, Pa.
FREEMAN, F. C., Providence, R. I.
HAFTENKAMP, J. P., Rochester, N. Y.
HOWARD, A. C., New York, N. Y.
SEERLE, W. J., Philadelphia, Pa.
SPERR, F. W., Pittsburgh, Pa.
VITTINGHOFF, H., Boston, Mass.
WILLIEN, L. J., Boston, Mass.

Representing Affiliated Societies

BERTKE, W. J., Sioux City, Ia. (Iowa)
BROWN, J. A., Jackson, Mich. (Michigan)
CORNISH, R. C., Philadelphia, Pa. (Pennsylvania)
DUNN, F. S., Albany, N. Y. (Empire State G. & E.)
ELBERT, V. L., St. Joseph, Mo. (Missouri)
FERRIER, Jas., Atlanta, Ga. (Southern)
HALL, E. L., Portland, Ore. (Pacific Coast)
HOY, C. W., Glassboro, N. J. (New Jersey)
HUMPHREYS, J. J., Montreal, Can. (Canadian)
JOHNSON, G. M., South Bend, Ind. (Indiana)
LYONS, B. F., Beloit, Wis. (Wisconsin)
OTTEN, JR., C. H., Plymouth, Mass. (Gas Sales of N. E.)
PAIGE, C. E., Worcester, Mass. (N. E. Gas Eng.)
RICHARDSON, R. B., Peoria, Ill. (Illinois)
SEDBERRY, W. H., Marshall, Texas (South Central)

Report of A.G.A. Sub-committee on the Use of Coke and Bituminous Coal Mixtures as Water Gas Generator Fuel

C. W. BRADLEY, Chairman, Chicago, Illinois.

(Prepared under direction of the Chairman by W. A. Dunkley, U. S. Bureau of Mines.)

THE use of bituminous coal for water gas generator fuel has received considerable attention from certain gas companies during the past few years. The fuel supply conditions during the latter part of the war period stimulated the use of coal for this purpose, especially in the Middle West, and resulted in considerable improvement in the technology of the use of coal for gas making. In spite of the improved results obtained with coal, it can hardly be regarded as the ideal generator fuel. Competing with good coke, bituminous coal would hardly be chosen as generator fuel unless the particular plant for which it was selected had ample production capacity and the differential price between coal and coke would promise a substantial saving from the use of the former fuel, even in the

face of the usually lower efficiencies to be expected with it.

In examining the reports of comparative tests which have been made with the two types of fuel, one is impressed with the wide variety of results obtained. In some cases the efficiencies obtained with coal appear very unfavorable as compared with coke, in other cases the fuels are almost on a par. This is perhaps not at all surprising when one considers the wide variation in quality in fuels of one particular type. Some bituminous coals are much better than others for water gas making just as some cokes are better than others. In fact there seems to be even more possibilities of variation in coal quality since most of the cokes available are at least made from selected coals or coal mixtures. Therefore to

draw an accurate conclusion relative to the merits of the two types of fuels for water gas making, it is obviously misleading to compare a good coke with a poor coal or vice versa.

The conclusions to be drawn from the results of many comparative tests under various conditions, seem to be:

1. That the use of bituminous coal usually results in a reduction of set capacity.
2. That more generator fuel, per 1,000 cu. ft. of gas made, is usually required when coal is used.
3. Under certain conditions the oil consumption is less when making a specified quality of gas with coal.
4. Under certain conditions the set maintenance costs are increased when using coal.
5. The clinker resulting from coal is usually easier to handle than the clinker from coke.

The reasons for these differences in performance with the two types of fuel appear to be due to the following considerations:

The amount of gas that can be produced in a set in a given time is dependent upon the amount of steam which can be decomposed in that time. This in turn is dependent upon the amount of heat which can be stored up in the fuel bed during the blow period and abstracted by the steam during the run period. The amount of heat stored during the blow, assuming that the fuel bed is of uniform thickness and has no holes through, is in a measure proportional to the volume of blast put through the fuel bed per unit of time. With coal fuel we usually observe that it is not possible to put as much blast through the fuel bed in a given time as with coke. Also since the reactions between fuel and steam

probably do not take place until after the coal has coked, which requires several successive runs for completion, there is not, other things being equal, so much active fuel in the generator at one time when coal is used, so that in general it is not possible to store in the fuel bed as much available heat in a given time and under the same blast conditions with coal as with coke. Hence, the production capacity is usually less with the former fuel.

The generator fuel required per 1000 cu. ft. of gas made is usually greater with coal than with coke. A larger proportion of the total carbon of coal fuel is in the form of volatile matter, than in the case of coke, and it seems almost inevitable that where a larger proportion of the total carbon is present in this form, there is more loss of total carbon during the blast period, and, hence, a smaller proportion of the carbon will be transformed into gas during the steam run. This seems to be the case as observed from actual operation, but this loss of carbon in the form of volatile matter during the blow has been considerably reduced by the use of the so-called blow run, which consists in saving and mixing with the make gas, a small portion of the blast gas from the generator, at the time when this gas is at its best quality at the end of the blast period.

The fact that a certain amount of volatile matter of the coal is evolved during the steam run accounts for the richer quality of the uncarbureted gas from coal fuel and this higher quality makes possible a saving of carbureting oil in some cases. Where the oil required with coal fuel is higher than with coke, it is usually due to one of the following causes:

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1. Too long a blow run.
2. Closing the stack valve to make a blow run too soon after the carburetor blast valve has been closed, resulting in the inclusion of some burned gas remaining in the set with the blow-run gas.
3. Too long an air purge.
4. Holes through the generator fire.
5. Dirty checker work or poor oil distribution.

The higher maintenance costs with coal fuel are usually observed in the larger size water gas sets. In the larger sets the distribution of fuel in the generator is usually more difficult to make uniform and especially with the high blast pressures used in the effort to get capacity, holes are likely to form in the fuel bed. These result in a certain amount of secondary combustion occurring in the top of the generator, which has a destructive effect on the upper part of the generator and upper hot valve.

The cleaning time is usually less with coal than with coke fuel. It has been observed often that the clinker resulting from a coal is considerably easier to handle than the clinker resulting from the use of coke produced from the same coal. Just why this should be so is somewhat difficult to explain. The greater excess of steam usually employed with coal may account for a part of the difference.

The discussion of the results usually observed from the use of coal has been given, chiefly to point out the differences experienced with the two types of fuel so that results to be expected from the use of mixtures of coal and coke might be better understood. In experimenting with fuel mixtures the object has been, of course, to derive the benefits of the open, porous, chemically reactive structure of the coke fuel bed with the

richer blue gas produced from coal. Where coal is materially cheaper than coke, the results hoped for from the use of mixtures may be summarized as follows:

1. The coke in the mixture will make a more permeable fuel bed, resulting in a larger make of gas per unit of time. This increase in capacity may be greater than in direct proportion to the amount of coke used.

2. A fuel economy somewhere between that obtained with straight coke and that with straight coal will be realized.

3. The presence of the coal will make a richer blue gas than that obtainable with straight coke, therefore requiring less oil.

4. By making the fuel bed more permeable, the tendency to form blow-holes will be diminished, thereby permitting the production of more and better blue gas with the elimination of secondary combustion in the generator.

5. The ultimate object of using mixtures is, of course, to use as large a proportion of the cheaper fuel as possible, consistent with getting ample capacity and reasonably low fuel consumption.

While the results to be derived from the use of fuel mixtures appear to warrant consideration, inquiry made of several gas companies, who had experimented with coal as fuel, resulted in the information that very few of them had ever tried using mixtures. The first experiments of this kind of which the committee has record, are those conducted during 1915 by the St. Paul (Minn.) Gas Light Co. The test was of short duration, only three days, and the results were considered so greatly inferior to those obtained with straight coke that the experiments were abandoned. The

experimental run was made in a 11 ft. water gas set having an internal diameter of 8'-6". The coal was Youghiogheny screened 4" lump and the coal is described as Duluth and Milwaukee (probably by-product oven coke). The conditions and results of the test are given in Table 1.

In comparing the results given in Table 1 with those to be given later, it is to be borne in mind that the operating method was that usually employed with coke fuel, without any blow run. This accounts in a great measure for the very pronounced falling off in the make per sq. ft. of grate area with increasing percentage of coal. It will be noted too that the oil per M. and the generator fuel per M. increased as the percentage of coal increased. An increase in generator fuel would naturally be expected with this method of operation, but the increase in oil without any corresponding increase in B.t.u. of the gas is difficult to explain unless there were holes through the generator fire. The results having been obtained from a three days' run only on coal mixtures, can hardly be expected to show as good results as might have been realized after longer experimentation.

The Davenport Tests

The first long continued tests with coal and coke mixtures of which the committee has record were carried out by W. W. Odell of the Bureau of Mines in the gas plant of the United Light and Railways Company at Davenport, Iowa. These tests were reported in Technical Paper 284 of the Bureau.

The Davenport results were obtained on 8'-6" U. G. I. sets using mixtures of St. Louis horizontal retort coke and various coals, including Eastern Kentucky, Saline County, Ill., No. 5 coal; and Franklin County, Ill., No. 6 coal. Mixtures containing from 58 per cent coal to 89 per cent coal were tried; also runs were made with 100 per cent coal and with 100 per cent coke. The results obtained during the Davenport tests with various mixtures of fuels are shown in Tables II, III and IV.

From inspection of Tables II, III and IV, it is evident that the rate of gas make, fuel economy and oil economy are not directly proportional to the percentage of coke in the mixture. The rates of make under different conditions and especially with different sizes of sets, as will be taken up later, are best compared

TABLE 1
Operating Conditions and Results, St. Paul, Minn., 11'-0" Set

	0	23.6	72.9	83.9
Gas made, cu. ft. corrected	5,174,000	869,200	841,700	581,040
Hrs. operating, total	37.0	8.2	9.48	8.07
Make per running hr.	139,500	106,000	88,600	72,000
Make per set hr.	110,400	85,000	70,700	50,000
Make per running hr. per sq. ft. grate	2,458	1,867	1,562	1,268
Make per run	19,790	18,700	15,500	11,200
Min. blow	3.57	3.78	3.22	2.98
Cycle min. run	3.92	4.36	4.94	5.15
Up and down runs				
Air per min. blow	6,768	6,650	6,272	5,871
Air per M. to generator	1,209	1,344	1,302	1,562
Steam per min.	145	135	115	92.5
Steam per M.	28.4	31.4	36.9	42.5
Generator Fuel per M.	27.7	33.4	39.5	44.1
Oil per M.	3.68	3.74	3.82	3.97
B.t.u. of Gas	626	628	648	631
Cleaning time per day	2.43	2.03	3.40	3.55

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by noting the make per running hour per sq. ft. of grate area. With Eastern Kentucky coal in Table II the make decreases as the percentage of coal increases. This is not the case, however, with Illinois coals as shown in Tables III and IV. In both these cases the maximum make is obtained with percentages of coal around 70 to 75 per cent. The fuel per 1000 cu. ft. of gas made likewise bears no direct relation to the composition of the mixture. In Tables III and IV the minimum fuel per M. occurs with mixtures containing 70 per cent and 73 per cent coal respectively. The oil results show considerable variation partly attributable to the quality of gas made at the time, but in no wise bearing any direct relations, apparently, to the character of the fuel mixture. It will be noted that the blow-run method of operation was employed with the mixtures and that using this method the rate of make compared favorably with the rate when using 100 per cent coke by the usual method without the blow run.

Ottawa Tests

In order to study further the results obtainable with fuel mixtures in other plants under other conditions, a series of runs was made in the plant of the Public Service Company of Northern Illinois at Ottawa, Illinois, and also a test at the plant of the Beloit Water, Gas and Electric Company at Beloit, Wis. The former test was carried out under the supervision of W. A. Dunkley of the Bureau of Mines and the latter by R. G. Krumrey of the Beloit Company. In order to make the Ottawa and Beloit tests more comparable, an arrangement was made whereby both plants received the same kinds of fuel for testing, therefore, allowing for variations in individu-

al carloads of fuel, the differences in results are due to differences in operating conditions.

The coke used in the tests at Ottawa was made from Eastern Kentucky coal in the horizontal retort plant at Kankakee, Illinois. The coal was obtained from W. Frankfort, Franklin Co., Illinois. Analyses of these fuels are given in Table V. Both coal and coke were forked for use, using forks with tines 1 inch apart. The set used during the test was a 6'-0" diameter U. G. I. water gas set. The internal diameter of the generator was 4'-0", and the grate area 12.56 sq. ft. The daily operating time averaged only about 10 hours. In making a test, the station meter was read each morning before starting, with the relief holder empty. At night after shutting down the set, the relief holder was again emptied and the station meter read. The accuracy of the station meter was proved after the test. The barometer and temperature corrections were computed from the average of several readings throughout the day. The set was cleaned in the morning before starting and again about noon so that approximately the same number of runs were made after each clean. The oil meter was read at the beginning and end of the day's run and the oil used as shown by the meter was checked against tank measurements over the period of the test. In this case a very close agreement was shown. The oil was a Texas fuel oil of about 23 deg. Be.

The heating value of the gas at the station meter outlet was determined at 2-hour intervals throughout the day's run. During a portion of the time a meter prover was used as a sample tank and collected a continuous sample throughout each 2-hour period. All the fuel to

the generator was weighed on a platform scale. Alternate charges of coal and coke were made, except during the last day, with each mixture when coal and coke were intimately mixed. When making alternate coal and coke charges a cone spreader was used with the coal, and the coke was dropped into the center of the fuel bed. The tendency, therefore, was to throw the coal, which is more resistant to the passage of air, to the outside of the more permeable coke to the center, thereby tending to even up the resistance to the blast throughout the diameter of the fire; since the tendency for the blast to pass up around the circumference rather than through the center, especially when using coal, is well known. The conditions of operation and results obtained at Ottawa are shown in Table VI.

From inspection of Table VI, it is seen that the greatest rate of make per sq. ft. of grate area was obtained with 60 and 70 per cent coal in the mixture. The rate of make was greater with these mixtures using a blow run than with 100 per cent coke employing the usual operating conditions. It was also distinctly greater than when using 80 per cent and 100 per cent coal. The generator fuel per M. was at a minimum with 70 per cent and 80 per cent coal, increasing with both increase and decrease of percentage of coal in the mixture. As stated in footnote to Table VI, however, the set had been freshly checkered and brought up to heat only two days before test was started. It is probable that an equilibrium had not been reached before the third day of the test run, when the generator fuel was 35.7 lb. per 1000 cu. ft. of gas, which seems about right for the fuel used, hours of daily operation, and size of set. It appears, however, from

the results that with 6 ft. sets quite as good results can be obtained with mixtures containing around 75 per cent of coal using a short blow run, with respect to both fuel and capacity, as can be obtained with 100 per cent coke under ordinary operating conditions. From the oil results no very definite conclusions can be drawn. There was some variation in B.t.u. of gas and even on days when the B.t.u. was the same there were differences in oil consumption, which apparently had no direct bearing upon gas quality. This may have been due in some cases to undetected holes through the fire during a portion of the day's run.

Beloit Tests

The Beloit tests were conducted by Mr. R. G. Krumrey, superintendent of the Beloit plant, using the same kinds of coal and coke as were used at Ottawa. The set used was also a 6'-0" U. G. I. set. The average running time per day was about 16 hours. The operating conditions and results are shown in Table VII.

From an examination of Tables VI and VII it is seen that the same effects of mixtures were not experienced in both cases. The gas make per hour per sq. ft. of grate area, at Beloit, decreased regularly as the percentage of coal was increased. There was also a steady increase in the generator fuel consumed per M. cu. ft. of gas made and the steam per M. increased likewise. One other outstanding fact is the considerably lower gas make per hour per sq. ft. of grate area during the Beloit tests, as compared with the Ottawa tests. This seems to be due partly to the longer cycle employed at Beloit. It will be noted that the total blowing time at Ottawa including blow run and purge was approximately 3 min-

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utes and the steaming time was 3 minutes, while at Beloit the blowing time with the same inclusions was 3 min., 15 sec. and the steaming time 4 min., 45 sec. It appears from these figures that a shorter steaming period and more steam, 38 lbs. as compared with 30 lbs. per minute, is rather more favorable for obtaining a higher rate of gas make than is a longer cycle. The rapidity of the valve changes would, of course, be of some importance in this connection.

The quality of gas made at Beloit was considerably lower than at Ottawa, 523 as compared with 565. This, of course, resulted in a lower oil consumption in the former case and the volume of oil gas made was probably a little less. It will be noted that the oil consumption at Beloit was distinctly less with 100 per cent coal than with mixtures.

Experiments with Mixed Anthracite and Bituminous Coals

In addition to the tests described above, a short test which may be of interest to eastern operators, was carried on about three years ago in the gas plant at Wilmington, Del., using a mixture of 50 per cent Elkhorn coal with 50 per cent St. Clair anthracite. Owing to the limited supply of Elkhorn coal, the test continued only two days. The set had an internal diameter of 8'-6". The following conditions and results were reported:

Average gas sendout	2,323,000 cu. ft.
Running time, hrs. per day	23.85
Gas make per running hour	98,000 cu. ft.
Gas make per run	14,000 cu. ft.
Make per hr. per sq. ft. grate	1,726 cu. ft.
Cycle (Blow 3 min. Run 4 min.)	
Air per minute	10,000 cu. ft.
Air per M	2,142
Steam per minute	123 lbs. down, 128 lbs. up
Steam per M	35.8
Oil per M	2.94
(Gas Oil, Mexican 34 deg. Be.)	
Generator fuel per M	33.57 lbs.
Heating value of gas	602 B.t.u.

Summary

To summarize the foregoing data, it may be said that results obtained with different sizes of water gas sets, indicate that when coal and coke mixtures are used, the rate of production tends to a maximum and the fuel consumption per 1000 cu. ft. of gas is lowest when a mixture of coke and coal containing about 70 to 80 per cent of coal is used.

The results at Ottawa and at Davenport showed higher rates of make with mixtures of this proportion, using a blow run, than were obtained with 100 per cent coke, employing the usual coke operating methodes without the blow run. It may be said in this connection that the coke used during the straight coke run was the same kind as that used in the mixtures.

In no case was the high rated capacity as listed by the U. G. I. Company obtained with 100 per cent coke fuel. This was due to the fact that the blast pressure available was only 24 to 26 inches, whereas, the tables of nominal rating call for 36" blast pressure with 6'-0" sets and 42" with 8'-6" sets. With mixtures containing 70 to 80 per cent coal using a blow run, a production up to 97.5 per cent of the nominal rated capacity was obtained with the 6'-0" set at Ottawa and 92.3 of the rated capacity was obtained at Davenport with the 8'-6" set. With 100 per cent coke, the productions at Ottawa and Davenport were 93.6 per cent and 86.9 per cent, respectively, of the nominal rated capacity and with 100 per cent coal they were 87.8 and 81.4 per cent.

It appears from the above that the use of coal and mixtures results in smaller reductions in production capacity in small sets than in large ones. Also in a 6'-0" set the fuel and oil efficiencies obtainable

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under the usual operating conditions prevailing, viz., a moderate blast pressure of 24 to 26 inches, compare very favorably with those obtained with 100 per cent coke. The Beloit test shows increasing fuel consumption with increasing coal percentage in the mixture, but possibly had a shorter cycle been adopted, an improvement in fuel efficiency and production rate with mixtures might have resulted.

It is regrettable that it is not possible to present any data on the use of mixtures in larger sets, such as 10'-6" or 11'-0" sets, using the blow-run method. The results reported from St. Paul were obtained in 1915; the run was very short and only the usual coke operating methods were used, no blow run being tried,

so the results are hardly comparable with the other results presented.

The writer's experience has indicated that with 100 per cent coal, the tendency toward the formation of blow holes in the generator fuel bed is greater with the large sets than with small ones and this tendency is accentuated with the use of very high blast pressures in the effort to get capacity. As a result the production rate realized with 11'-0" sets thus far is not over 50 per cent of the nominal rated capacity. With fuel mixtures the tendency to channeling would probably be diminished, but it is not believed that the production rate would be as high a per cent of the nominal rating as can be obtained with smaller sets.

Table II
Operating conditions and results obtained using coal, coke and mixtures of coal and coke as Generator fuel, in 8'-6" Set at Davenport, Ia.

Eastern Kentucky coal and St. Louis gas-house coke (horizontal retorts)				
Per Cent Coal	65	74	89	100
Gas made, corrected, cu.ft.	1,172,000	1,119,000	1,018,000	1,059,000
Number of runs made	133	135	129	146
Make per run, cu. ft.	8,810	8,290	7,890	7,180
Make per run-hour, cu. ft.	83,600	77,700	74,900	69,600
Make per set-hour, cubic feet	79,100	72,200	70,200	63,600
Make per sq. ft. of grate per run-hr.	2,520	2,340	2,260	2,050
Oil per 1,000 gallons	2.68	2.88	2.96	3.09
Fuel per 1,000 pounds	Wet, 33.2	39.1	35.2	Wet 34.5
B.t.u.	545	554	550	559
Cycle				
(Blast	2 m. 30 s.	2 m. 40 s.	2 m. 40 s.	2 m. 30 s.
(Run	2 m. 54 s.	2 m. 50 s.	2 m. 50 s.	3 m. 0 s.
(Purge	0 m. 6 s.	0 m. 0 s.	0 m. 0 s.	0 m. 0 s.
(Blow-run	0 m. 30 s.	0 m. 30 s.	0 m. 30 s.	0 m. 30 s.
Up runs and split runs	2 up runs after charging, then split runs 50/50		1st and 3rd up runs after a charge, then split runs	Alternate up runs and split runs
Air per. min. approximate	4,770	4,150	4,050	a 4,350
Air per 1,000 ft. approximate	1,440	1,440	1,460	1,620
Steam per min., pounds	85	85	85	85
Steam per 1,000 ft., pounds	26	26.7	28	32.6
Average weight of charge, lbs.	1,570	1,750	1,420	1,385
Method of charging	1 buggy of coal, 1 buggy of coke. Forked	1 buggy of coal ½ buggy of coke Shoveled	Alternate coal, & coal and coke Forked	Coal only Forked
Fuel b				
Number of run-hours	14.03	14.4	13.6	15.4
Clinkering time	2 cleans, 0.79 hr.	2 cl., 1.1 hrs	2 cl., 0.9 hr.	2 cl., 1.1 hrs.
Runs between clinker periods	61	65	65	72
Condition of clinkers	Easily removed None on wall	Easily remov'd None on wall	Easily remov'd None on wall	Easily remov'd None on wall
H ₂ S in raw gas, grains per 100 liters	120	120	140	140
Total sulphur in finished gas, grs.	10	10	10	10
Air-blast pressure under grates	25"-26"	25"-27"	25"-27"	25"-26"
Steam pressure at boiler, lbs.	125	125	125	125
Average oil per run, gallons	23.6	23.9	23.4	22.2
Air per min. of blow-run	1,600	1,570	1,540	(1,600 1,500

a High air per minute and air per M. due to large size of coal and to air holes in fuel bed.

b The coke was shoveled in each case cited and was rather small.

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Table III

Operating conditions and results obtained using coal, coke and mixtures of coal and coke as generator fuel—in 8'-6" sets at Davenport, Ia.

Illinois coal and St. Louis coke. Saline County coal. No. 5 seam.					
Per Cent Coal	58	65	70	73	100
Gas made corrected, cubic feet	1,254,000	932,000	1,041,000	1,044,000	1,215,000
Number of runs made	159	115	124	124	170
Make per run, cubic feet	7,890	8,100	8,400	8,430	7,150
Make per run-hour, cubic feet	75,600	75,200	79,000	75,700	67,900
Make per set-hour, cubic feet	65,000	65,600	66,800	63,400	60,500
Make per sq. ft. of grate per run-hr.	2,280	2,260	2,380	2,280	2,040
Oil per 1,000 cu. ft., gallons	2.97	3.17	2.76	3.20	3.33
Fuel per 1,000 cu. ft., pounds	Wet 37.0	Wet 42.1	36.6	37.0	43.0
B.t.u.	550	575	568	565	565
Cycle	(Blast	2 m. 30 s.	2 m. 30 s.	2 m. 40 s.	2 m. 30 s.
	(Run	2 m. 54 s.	3 m. 0 s.	2 m. 50 s.	3 m. 0 s.
	(Purge	0 m. 6 s.	0 m. 0 s.	0 m. 0 s.	0 m. 0 s.
	(Blow-run	0 m. 30 s.	0 m. 30 s.	0 m. 30 s.	0 m. 30 s.
Up runs and split runs	First and 3rd after charging were up runs. All others split runs.				
Air per min. approximate	4,200	4,350	4,200	4,540	4,050
Air per M., approximate	1,460	1,440	1,440	1,440	1,550
Steam per min., pounds	80	85	85	85	85
Steam per M., pounds	27.4	31.5	26.3	28.8	32.0
Average weight of charge, pounds		1,710	1,520	1,665	1,380
Method of charging	Alternate charges of coal and coke.	1 buggy of coal, ½ buggy of coke	1 buggy of coal, ½ buggy of coke	1 buggy of coal, ½ buggy of coke	Coal only
Fuel	Forked	Forked	Forked but contained slack	Forked but contained slack	Forked but contained slack
Number of run-hrs.	16.6	12.4	13.2	13.8	17.9
Clinkering time	3 cleans, 2.7 hrs.	2 cleans 2.4 hrs	2.4 hrs.	2 cleans 2.7 hrs.	3 cleans 2.2 hrs.
Condition of clinkers	Somewhat gummy. None on the wall.	Gummy & on grate. None on wall.	Gummy & on grate. None on wall.	Gummy & on grate. None on wall.	Gummy. On grate. None on wall.
H ₂ S in gas, grains per 100 liters	260	260	270	270	400
Total sulphur in finished gas, grains	13		14	14	16.2
Runs between clinker periods	55	55	60	60	55
Air-blast pressure under grates	25"-26"	25"-26+"	25"-26+"	25"-26+"	25"-26+"
Steam pressure at boiler, pounds	125	125	125	125	125
Average oil per run, gallons	23.4	25.7	23.2	27.0	25.0
Air per min. of blow-run	1,600	1,600	1,560	1,560	1,500

Table IV

Operating conditions and results obtained using coal, coke and mixtures of coal and coke as generator fuel in 8'-6" Set at Davenport, Ia.

Illinois Coal and St. Louis Coke.		Franklin County coal, No. 6 seam.		St. Louis Retort Coke.	
Per Cent Coal	67	73	77	100	
Gas made correct, cubic feet	952,000	1,186,000	1,045,000	1,008,000	1,181,000
Number of runs made	112	136	134	151	136
Make per run, cubic feet	8,500	8,710	7,800	6,675	8,700
Make per run-hour, cubic feet	79,300	82,400	84,400	74,100	79,400
Make per set-hour, cubic feet	70,500	71,000	71,500	64,000	68,200
Make per sq. ft. of grate per run-hr.	2,380	2,480	2,540	2,230	2,390
Oil per 1,000 cu. ft., gallons	2.4	2.44	2.88	2.99	3.04
Fuel per 1,000 cu. ft., pounds	42.4	41.0	46.6	48.0	33.3
B. t. u.	528	535	550	555	543
Cycle	(Blast	2 m. 30 s.	2 m. 30 s.	2 m. 0 s.	2 m. 30 s.
	(Run	3 m. 5 s.	3 m. 5 s.	2 m. 30 s.	3 m. 22 s.
	(Purge	0 m. 0 s.	0 m. 0 s.	0 m. 0 s.	0 m. 8 s.
	(Blow-run	0 m. 25 s.	0 m. 25 s.	0 m. 30 s.	0 m. 0 s.

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TABLE IV (Continued)

Per Cent Coal	0	60	70	80	100
Up runs and split runs	All split runs ¾ m. up; 1¼ m. down; ½ m. up.	All split runs. ¾ m. up; 1¼ m. down; ½ m. up.	All split runs. ½ m. up; 1½ m. down; ½ m. up.	Half split runs. ½ m. up; 1½ m. down; ½ m. up.	All runs split 50/50.
Air per min., approximate	4,630	4,720	4,950	4,700	5,050
Air per 1,000 ft., approximate	1,460	1,450	1,500	1,620	1,500
Steam per min., pounds	83.5	83.5	85	8	75.5
Steam per 1,000 ft., pounds	27.5	27.2	26.2	30	28.2
Average weight of charge, pounds	1,920	1,700	1,920	1,400	1,600
Method of charging	Alternate, coal and coal with coke.	Alternate, coal and coal with coke.	1 buggy of coal, ½ buggy of coke.	Coal only.	Coke only
Fuel	Forked	Forked	Forked	Forked but contained slack.	Shoveled.
Number of run-hours	2 cleans, 1.5 hrs.	3 cleans, 2.3 hrs.	3 cleans, 2.2 hrs.	3 cleans, 2.15 hrs.	3 cleans, 2.45 hrs.
Clinkering time		45	45	50	45
Runs between clinker periods	55				
Condition of clinkers	Tendency for wall clinkers to form. Grate clinkers were semirotten.	Tendency for wall clinkers to form. Clinkers on grates were semirotten.	Tendency for wall clinkers to form. Clinkers on grates were semirotten.	Wall clinkers formed.	Hard. Some on sidewall.
H ₂ S in raw gas, grains per 100 liters	120	120	120	120	115
Total sulphur in finished gas, grains	10.1	10.1	10.1	10	9.5
Air-blast pressure, under grates	25"-26"	25"-26"	25"-26"	25"-27"	25"
Steam pressure at boiler, pounds	125	125	125	125	125
Average oil per run, gallons	20.2	21.2	22.4	20	24.2
Air per minute of blow-run	1,600	1,600	1,600	1,600	0

Table V
Analyses of Fuels Used in Ottawa Tests*

	Coke made at Kankakee in horizontal retorts from Elkhorn coal	Air Dried Basis No. 1 Mine "Southern Gem" Coal Corporation from W. Frankfort, Illinois
Moisture	2.1	4.2
Volatile matter	5.2	34.4
Fixed carbon	79.4	51.2
Ash	13.3	10.2
B.t.u.	12280	12320
Sulphur	0.7	1.0

*Fuels from the same sources were used in the Beloit tests but no analyses of the receipts at Beloit were made.

Table VI
Operating Conditions and Results at Ottawa, Ill., 6'-0" Set.

Per Cent Coal	0	60	70	80	100
Gas made, cu. ft. corrected	1,068,000	1,080,700	1,035,000	1,468,300	1,093,000
Hours operating, total	27.89	31.01	29.70	44.20	35.04
Make per running hour	33,283	34,840	34,786	33,215	31,186
Make per set hour	31,260	29,583	28,678	28,411	27,047
Make per hr. per sq. ft. grate	2,642	2,765	2,761	2,636	2,476
Make per run	3,508	3,632	3,388	3,301	3,065
Cycle (Blow	3 min.	2 m. 54 s.	2 m. 31 s.	2 m. 38 s.	2 m. 30 s.
(Blow-run	0 min.	0 m. 25 s.	0 m. 25 s.	0 m. 25 s.	0 m. 25 s.
(Steam run	3 min.	3 m. 0 s.	3 m. 0 s.	3 m. 0 s.	3 m. 0 s.
(Air purge	0 min.	0 m. 5 s.	0 m. 5 s.	0 m. 5 s.	0 m. 5 s.
Up and down runs	U-D-2U-D and repeat	Alternate	Alternate	U-D-U-ZD and repeat	Alternate

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TABLE VI (Continued)

	67	73	77	100	
Per Cent Coal					
Air per min. cu. ft.					
(Blow	2,235	1,868	1,838	1,769	1,757
(Blow-run	0	1,001	975	941	931
(Air-purge	0	1,383	1,348	1,347	1,249
Air per M. to generator	1,877	1,320	1,288	1,334	1,327
Steam per minute	37.4	36.4	49.8	38.0	38.0
Steam per M. cu. ft. of gas	35.1	30.1	35.1	34.5	37.2
Generator fuel per M.	39.4*	36.0	34.7	34.7	37.7
Oil per M.	3.17	3.38	3.24	3.06	3.33
B.t.u. of gas	562	559	566	555	573
Average run hrs. per day	9.8	9.54	9.22	10.58	11.40
Cleaning time per day, hrs.	2.07	1.84	2.13	1.87	1.79
Blast pressure under grate	26"-27"	25"-26"	25"-26"	25"-26"	25"-26"

*Set was rechecked two days before beginning test. On last day of test coke was 35.7 per M.

Table VII
Operating Conditions and Results—Beloit Tests. 6'-0" Set

	52	66.7	80	100	
Per Cent Coal					
Gas made, cu. ft. corrected	3,162,900	3,523,300	5,391,700	11,994,100	
Hours operating, total	111.0	124.2	195.4	507.9	
Make per running hour	28,490	28,350	27,580	23,611	
Make per set-hour					
Make per running hour per sq. ft. grate	2,374	2,362	2,298	1,967	
Make per run	4,070	4,050	3,940	3,373	
Cycle					
(Blow	2 min. 35 sec.				
(Blow-run	0 min. 25 sec.				
(Steam-run	4 min. 45 sec.	same	same	same	
(Air purge	0 min. 15 sec.				
Up and Down runs	First after coaling up and last before coaling up with all mixtures. All others split 2 min. up, 2 min. down, 45 sec. up.				
Air per minute, cu. ft.					
(Blow	1,870	1,870	1,870	1,870	
(Blow-run	1,000	1,000	1,000	1,000	
Air per M. to generator	1,360	1,365	1,400	1,640	
Steam per minute	30 lbs. up; 34 lb. down	same	same	same	
Steam per M. cu. ft.	36.6	36.8	37.8	44.2	
Generator fuel per M.	34.5	39.3	41.8	45.2	
Oil per M.	2.79	2.80	2.87	2.61	
B.t.u. of gas	522	523	523	522	
Average daily running time	About 16h. per day	45 m. ca.			
Cleaning time per day, hrs., 2 cleans per day of					
Blast pressure under grate	24"	24"	24"	24"	

(Continued from page 48.)

On trying to find a way to induce our visitors to go to the basement, I thought of a moving picture. I secured the "Spirit of Service," the motion picture of the gas industry, from the A. G. A. Headquarters, and for the last four days showed the picture afternoon and evening on the whitewashed walls of the

basement. There it was seen by over 12,000 people.

All of us know what comfort gas brings to homes, and of the many avenues open to gas companies to demonstrate this fact. Let us make full use of the publicity obtainable for popularizing gas through the medium of movements such as Better Homes.

Report of the Committee on the Utilization of Compressed Air for Clearing House Piping

J. T. GRIFFIN, Chairman, Baltimore, Md.

TO thoroughly explain the complete operation of pumping pipe would require an extensive report. For this reason, the Committee presents its report in brief with the idea that in the event of any company desiring further information, upon stating their specific trouble, the Committee will be in a position to offer instructions suited to the individual case rather than giving general instructions which possibly would not cover their needs.

Questionnaires were forwarded to twenty-six of the larger companies of the country and after a careful study of the replies received, the Committee decided that in its final report no set of rules should be applied, but precautions should be offered and a resume of the various successful operations given.

No general type of tank is used as an air container. Some companies use the ordinary water boiler with a capacity of from ten to forty gallons, while others use small, steel cylinders of the automatic acetylene tank type. Various types of steel cylinders and drums are used where the maximum pressure, desired by the respective companies, ranges from eighty to two hundred pounds. In this connection, the Denver Gas and Electric Light Company used two Ford trucks equipped with Rotary Compressors driven from the motor trucks to a special transmission and chain drive. This company reports that the system is entirely satisfactory and the maintenance quite small. Many of the companies use the high pressure

steel oxygen cylinder with the pressure ranging from one thousand to two thousand pounds. These tanks vary in weight from thirty-five to one hundred and fifty pounds. Such companies either compress their own air or else obtain the air from one of the Air Reduction Companies in the vicinity. No comparative cost could be obtained on the operation of each type of tank or compressor, because the extent of each operation depended entirely upon the local conditions encountered and also upon the gratuitous service offered by the companies.

Many companies equip their tanks with pressure gauges or relief valves. Some of these gauges are of the reduction type and the extent of the pressure released is controlled by the maximum pressure by which the gauges are set. Other companies use gauges with a maximum range from one hundred to one hundred and fifty pounds. In such cases the tank operators control the amount of pressure released in accordance with rating of the gauge. These types are more generally favored and are used with a caution to the operator not to allow any more pressure to be exerted on the tanks than the maximum range shows. Several of the companies do not use gauges but depend upon the skillfulness of the tank operators for the amount of the released pressure required.

The success of the operation depends entirely upon the skillfulness of the workman. In this respect, none but thoroughly experienced men should be

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engaged; particularly so, when high pressure tanks of one thousand and two thousand pounds capacity are used. Too much stress cannot be placed upon the education of these men. They should be instructed as to the various reasons why precautions should be taken and the trouble which may be encountered.

The connection from the tanks to the piping should be made with either iron pipe or specially adapted hose connections. Hose is more generally used, as it affords an economy in labor. The meter should be disconnected and provisions made to catch the expelled accumulation from the piping. Some companies connect a damp bag to the outlet of the piping and have reported excellent results in preventing the deposits from being blown into the cellar. Other companies connect a hose from the outlet of the piping to a window and allow the deposit to be blown into the open air.

In pumping the pipe, no general rule can be applied other than that the air should be gradually released, care being taken where gauges are used not to allow the pressure to exceed the range of the gauge and in cases where gauges are not used, the possibility of a back pressure which may affect the piping. Different local conditions require different operations; such as, the removal of lamps or fixtures. Some companies find it necessary to remove such equipment while others do not. The amount of air used is always dependent upon the character of the stoppage and the extent of time employed in operation is dependent upon the policy of the respective companies. Some companies allow unlimited time gratuitously, while others allow from one-half an hour to several hours.

The possibility of the stoppage of fixtures is the most important feature to be guarded against and the advisability of removing the fixture must be left to the discretion of the respective companies. However, in this respect, the Laclede Gas Light Company of St. Louis has adopted what is termed the "Back Shot" method which they claim does not have the tendency of stopping fixtures. The operation of this method has produced very good results. A piece of three-quarter inch garden hose, about ten feet long, is used between the air tank and the house pipe. This hose is attached at each end to a nipple; the hose being made fast to the nipple by a hose clamp. At the tank there is a pressure gauge which registers the air pressure as it builds up in the piping and at the house pipe there is a tee connection equipped with a stop cock. The air is turned on very gradually until a pressure of fifteen or twenty pounds has been built up, then the stop cock is opened suddenly and the air, as it rushes out, draws the rust out with it. This is repeated a number of times until the stoppage is well loosened and then a charge of thirty pounds is used, which in most cases, will thoroughly clear the pipe. This method has proven successful, as it was only necessary to take up the flooring and cut the pipe in one case out of twenty-five.

In conjunction with the use of compressed air, in clearing stoppages beyond the meter, quite a few companies are using compressed gas to clear stoppages from services. As the method of operation is somewhat different in each company, it would not be well to go into detail now, but the Committee feels that they have sufficient data on hand to take care of the request of any company and upon receiving such requests would

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be in a better position to furnish information which will be suited to the respective needs of each company.

From the experience obtained from the use of highly compressed air, it can be considered indispensable in rendering good service to our customers. It has proven an inexpensive and satisfactory solution of one of our most aggravating problems, and for this reason the Committee officially endorses its application.

In view of the study made of Compressed Air, the Committee offers general rules of precaution to be observed and which have been compiled from many experiences:

Precautions: High Pressure Tanks should be handled in such a manner as to prevent them from falling over on the floor. Cases have been known where tanks have fallen out of wagons and on the floor, causing the valves to break off and allowing the tank to run wild which resulted in considerable damage. High Pressure Tanks should not be handled without the valve cap being placed properly over the valve. A case was known where a workman, in picking up the tank, lifted it by the valve handle. In doing so, the valve was turned and opened, with the result that portions of the condensation in the tank blew out over the walls of the room, thus making it necessary for the room to be re-papered.

Particular attention should be given to the valve. The workman should not be allowed to use a wrench to turn off the valve as it has been shown that such application causes the seats of the valve to be deranged and the valve stems twisted, thus causing the valves to leak. To offset this, several companies have adopted a lever handle valve. Customers should be advised to keep away from the opening where the blow comes

through, also from the room in which the tank is being operated. There was a case where a hose connection blew off and frightened the customer to such an extent that a physician had to be summoned. This case resulted in a claim against the company for nervous prostration. The workman should be taught to realize the importance of carefully handling the tank both in transportation and in operation. He should not be rushed on the work, but should be given a chance to think, especially while he is on the job.

Tanks should be of such weight and size that the workman can handle them comfortably. Tanks while under pressure should not be left exposed to the heat of the sun or left in a very warm room. A case was cited where a tank which had been charged to two thousand pounds, with the safety valve set to two thousand five hundred pounds, after standing for some time in a very warm kitchen, blew the safety valve and badly frightened the occupants of the house.

Pressure:—The gauges should be attached near the tanks, so that the operators may be in a position to ascertain the extent of pressure released. Observation should be made as to the condition of the fixtures and piping before the air is applied, for such observations will be a guide to the workman and he will be in a position to know the amount of pressure of air necessary and whether or not it would be advisable to use air.

The reports from the various companies, in answer to the questionnaire sent out, cover the individual operations of each company and are on file at the Association headquarters where they can be readily referred to or copies furnished upon request.

Associations Affiliated with A. G. A.

Canadian Gas Association

Date of Affiliation—Mar. 25, 1919
Pres.—Col. D. R. Street, Ottawa Gas Co., Ottawa, Ont., Can.
Acting Sec.-Tr.—E. A. Hills, Consumers' Gas Co., Toronto.
Conv., 1923.

Empire State Gas and Electric Association

Date of Affiliation—Nov. 21, 1919
Pres.—M. J. Brayton, Utica Gas & Electric Co., Utica, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.
Conv., 1923.

Illinois Gas Association

Date of Affiliation—Mar. 19, 1919
Pres.—R. S. Wallace, Central Illinois Light Co., Peoria, Ill.
Sec.-Tr.—R. V. Prather, 305 Illinois Mine Workers Bldg., Springfield, Ill.
Conv., Sherman Hotel, Chicago, Ill., March 1923.

Indiana Gas Association

Date of Affiliation—April 24, 1919
Pres.—F. B. Tracy, Central Indiana Gas Co., Muncie, Ind.
Sec.-Tr.—E. J. Burke, Citizens Gas Co., Indianapolis, Ind.
Conv., West Baden Springs Hotel, West Baden, Ind., May, 1923.

Iowa District Gas Association

Date of Affiliation—May 21, 1919
Pres.—H. B. Maynard, Citizens Gas & Electric Co., Waterloo, Ia.
Sec.-Tr.—H. R. Sterrett, Des Moines Gas Co., Des Moines, Ia.
Conv., April, 1923.

Michigan Gas Association

Date of Affiliation—Sept. 18, 1919
Pres.—Fred W. Seymour, Battle Creek Gas Co., Battle Creek, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Conv., 1923.

Missouri Association of Public Utilities

Date of Affiliation—June 18, 1920
Pres.—E. R. Locke, Missouri Utilities Co., Mexico, Missouri.
Sec.-Tr.—F. D. Beardalee, 315 N. 12th St., St. Louis, Mo.
Wiley F. Corl, Chmm. Affiliation Com., Missouri Utilities Co., Mexico, Mo.
Conv., 1923.

New England Association of Gas Engineers

Date of Affiliation—Feb. 19, 1919
Pres.—V. E. Bird, Connecticut Power Co., New London, Conn.
Sec.-Tr.—J. L. Tudbury, Salem Gas Light Co., Salem, Mass.
Conv., Boston, 1923.

Gas Sales Association of New England

Date of Affiliation—Oct. 1, 1919
Gov.—F. A. Woodhead, Arlington Gas Light Co., Arlington, Mass.
Sec.—M. Bernard Webber, 150 Congress St., Boston, Mass.
Annual Meeting, 1923.

New Jersey Gas Association

Date of Affiliation—April 25, 1919
Pres.—Jacob B. Jones, Bridgeton Gas Light Co., Bridgeton, N. J.
Sec.-Tr.—H. E. Mason, Consolidated Gas Co. of N. J., Long Branch, N. J.
Conv., 1923.

Pacific Coast Gas Association

Date of Affiliation—Sept. 18, 1919
Pres.—F. S. Wade, Southern Counties Gas Co., Los Angeles, Cal.
Sec.-Tr.—W. M. Henderson, 812 Howard St., San Francisco, Cal.
Conv., 1923.

Pennsylvania Gas Association

Date of Affiliation—April 10, 1919
Pres.—Luther Gaston, Lebanon Gas & Fuel Co., Lebanon, Pa.
Sec.-Tr.—Geo. L. Cullen, Harrisburg Gas Co., Harrisburg, Pa.
Conv., 1923.

South Central Gas Association

Date of Affiliation—Oct. 15, 1919
Pres.—F. C. Armbruster, Southwestern Gas & Electric Co., Shreveport, La.
Sec.-Tr.—S. J. Ballinger, San Antonio Public Service Co., San Antonio, Texas.
Conv., 1923.

Southern Gas Association

Date of Affiliation—May 20, 1919
Pres.—P. H. Gadsden, The United Gas Improvement Co., Philadelphia, Pa.
Sec.-Tr.—G. H. Smith, City Gas Co., Norfolk, Va.
Conv., St. Petersburg, Fla., April 16-18, 1923.

Wisconsin Utilities Association

Pres.—J. P. Pulliam, Wisconsin Public Service Co., Milwaukee, Wis.
Exec.-Sec.—J. N. Cadby, 445 Washington Bldg., Madison, Wis.
Conv., Hotel Pfister, Milwaukee, Wis., March 22, 1923.

Employment Bureau

SERVICES REQUIRED

HIGH GRADE Industrial Sales Engineer wanted. Must be man having had factory experience and knowledge of house heating. Gas company in middle west has need of such a man and requests applicants to give full particulars of experience. Appointment for interview will be arranged. Address American Gas Association.

Key No. 0-3.

WANTED—Two men for eastern territory and one for middle west, who can earn not less than \$100.00 PER WEEK supervising campaign crews, selling gas appliances of great market possibilities. Made by the best known manufacturer of gas appliances in the world. Permanent position. Must be hustlers of executive ability. Give full particulars as to present position and experience. Address: A. G. A.

Key No. 04.

WANTED—High class foreman for water gas plant now sending out two million a day. Must be good on plant construction and repair as well as operation. State fully age, experience and salary expected. Answers will be considered confidential. Address A. G. A.

Key No. 06.

WANTED—A high grade commercial man to handle commercial work in a Southern Gas company in a town of 15,000 people. Must be capable of writing advertisements, arrange displays, and be willing to make a house to house canvass. Salary and commission basis of payment. Address A. G. A.

Key No. 07.

MANAGER or SUPERINTENDENT for combination coal and water gas property in city of 30,000 population. Should be thoroughly familiar and experienced in both coal and water gas manufacture and gas distribution and service. Reply, giving detailed statement of experience and education, references and salary expected. Also advise age, nationality. Location Southeast U. S. Address A. G. A.

Key No. 08.

WANTED as Head of the Promotion Division of a gas plant in middle western city of 100,000. Under his direction are meter repair men—trouble men—canvassers and appliance erecting men—a total of about 50 men, also to have charge of the merchandise stock with annual sales of approximately \$200,000. A man experienced in handling men and obtaining good work at reasonable cost particularly desired. Salary \$3,600.00 per year. Address A. G. A.

Key No. 10.

WANTED—Two Industrial Gas Salesmen for middle west city having an attractive gas rate. State experience, salary wanted. Address A. G. A.

Key No. 011.

WANTED—A progressive New England Gas Company selling annually 200 Automatic Water Heaters requires the services of a first class water heater salesman. Must be clean cut with personality and ability to sell consumers and plumbers. A good position for a good man. Give qualifications, age, experience, references and salary desired. Address A. G. A.

Key No. 012.

WANTED—Sales Engineer experienced in designing silica and fire clay Retort Benches and other furnaces. State experience and what acquaintance, if any, with the Gas Trade. Address A. G. A.

Key No. 013.

WANTED—We want a man of long experience on gas main and service work, particularly high pressure, setting and adjusting regulators, etc. State age, experience and salary desired. Address A. G. A.

Key No. 014.

SERVICES OFFERED

GAS APPLIANCE SALESMAN—Especially trained in water and house heating; 15 years' experience; desire selling position, either road or local, with aggressive appliance manufacturer or gas company. Will furnish best selling reference. Drawing account against commission. Address A. G. A.

Key No. 125.

WANTED—Position by a man of large general experience in gas business who has made a special study of sales promotion problems, and who would prove valuable as an assistant to a busy executive in any department. Address A. G. A.

Key No. 134.

WANTED—Position of responsibility as Manager or Industrial Fuel Engineer—18 years varied experience in the gas business. References and service record furnished. Address A. G. A.

Key No. 142.

WANTED—Position as executive in a local office of a gas or a combination gas and electric company. Have had a practical experience in all branches of commercial utility work. Have been successful in dealing with the public and promoting good will of utility companies. Educated in commercial and accounting methods as compiled by N. C. G. A. and N. E. L. A. Well acquainted in office routine and very exact on details and execution of same. Address A. G. A.

Key No. 114.

WANTED—Man of wide executive experience in gas accounting, statistics and system and a record of success in gas appliance merchandising, is now after illness of several years, prepared to sacrifice in size of salary if necessary to obtain exactly the sort of position he is looking for. Inquiries solicited. Address A. G. A.

Key No. 141.

POSITION WANTED—By-Product, Coke-Oven Executive seeks more responsible connection. Fitted for Chief Chemical Engineer, Assistant-Superintendent or Assistant to Manager. University Graduate. Alexander Hamilton Institute Graduate. Nearly seven years with present 3000 ton plant. Thirty-two years old. Married. Address A. G. A.

Key No. 151.

WANTED—Change in employment, where experience and sincere efforts may be better utilized and appreciated. Technical and with 18 years diversified experience in gas lines, having held positions of responsibility in manufacturing and distribution, in industrial fuel and in research engineering. Address A. G. A.

Key No. 144.

WANTED—Man 38 years of age with 20 years experience in both coal and water gas plants, would like to connect with some company, (preferably a small plant in New England) in the capacity of Manager, Superintendent, or Asst. to Superintendent. Best of references. Address A. G. A.

Key No. 145.

WANTED—Position as Assistant to Superintendent of either large coal or water gas plant, by young man twenty-five years of age who is now employed by combination coal and water gas plant in South. Experienced in calorimetry, statistics, plant records and general office work and would prove valuable to busy executive. Prefers Southern or Eastern territory, but will consider any location. Address A. G. A.

Key No. 146.

GAS ENGINEER wants position with holding company or large operating company, fifteen years' experience working directly under three successful managers with one of the most diversified Public Utility Companies in America. Experience includes design, construction and operation in all branches from coal mines to consumers' burners and rate structures. Address A. G. A.

Key No. 148.

GAS RESEARCH ENGINEER—Now employed by a Government technical bureau, would like position as Testing, Research, or Inspecting Engineer with a large gas company or a chain of gas properties. 37 years of age. Author of several Government, State and Technical journal reports on gas research problems. Active member of several A. G. A. technical committees. Has had several years of practical gas operating experience as chemist and superintendent in addition to gas investigative work. Address A. G. A.

Key No. 149.

YOUNG TECHNICAL GRADUATE with slight amount of gas experience and in valuation work wants position with gas company. Address A. G. A.

Key No. 150.

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